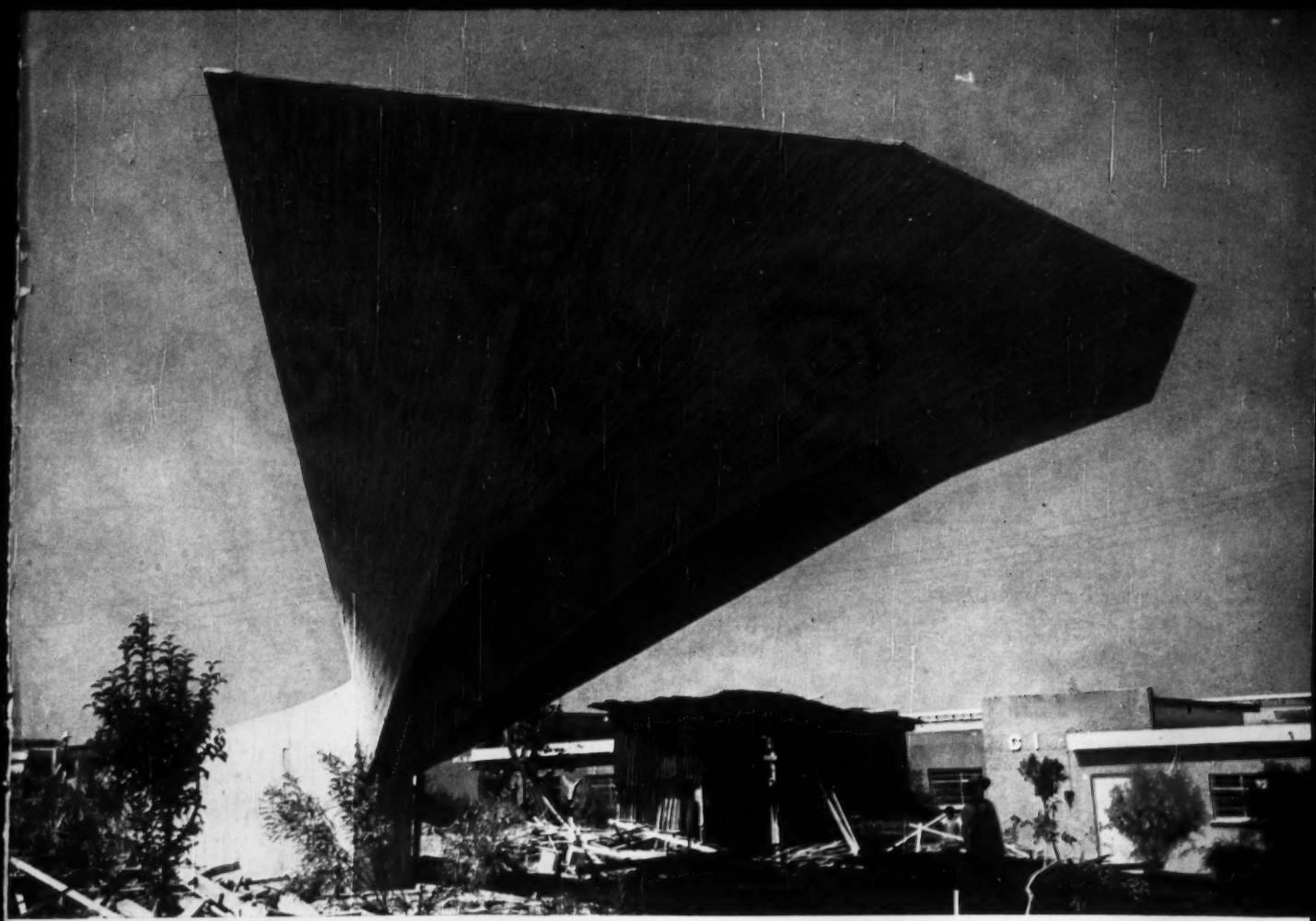
ENGINEERING NEWS-RECORD



Umbrellas over Mexico City p. 36

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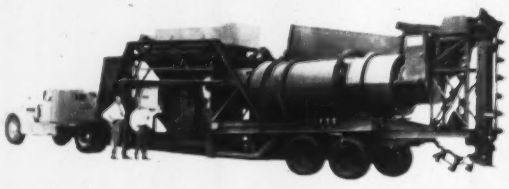

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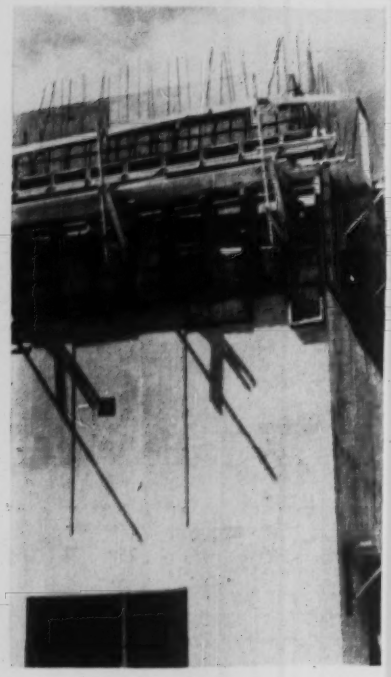


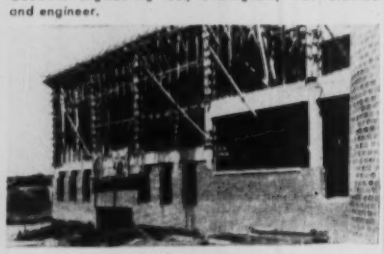
Walls, Slabs, Beams and Stairways Formed with SYMONS FORMS

8,500 square feet of Symons Forms with steel cross members, 200 column clamps and 520 shores were used by Sullivan Long and Hagerty, Birmingham, Alabama, for construction of the new $6,000,000 Jefferson County (Birmingham), Alabama, sewage treatment plant, vacuum filtration and flash drying building, and six digester tanks. The bin section of the plant is 60 feet high.

Forms were leap-frogged for successive lifts on the walls. Large pieces of plywood were attached to the face of the forms to form the recesses on the bin. Forms were also used for forming slabs, beams and stairways. Slab thickness ranged from five to seven inches and Symons 8-foot shores with 8-foot extensions on four foot centers were used to hold the slabs 23 feet high.

Symons Forms may be rented with purchase option. Symons Clamp & Mfg. Co., 4265 Diversey Avenue, Dept. E-7, Chicago 39, Illinois.

Sewage treatment plant has capacity of 40,000,000 gallons daily and serves an area of 610,000 population. Goodwin Engineering Co., Birmingham, was architect and engineer.



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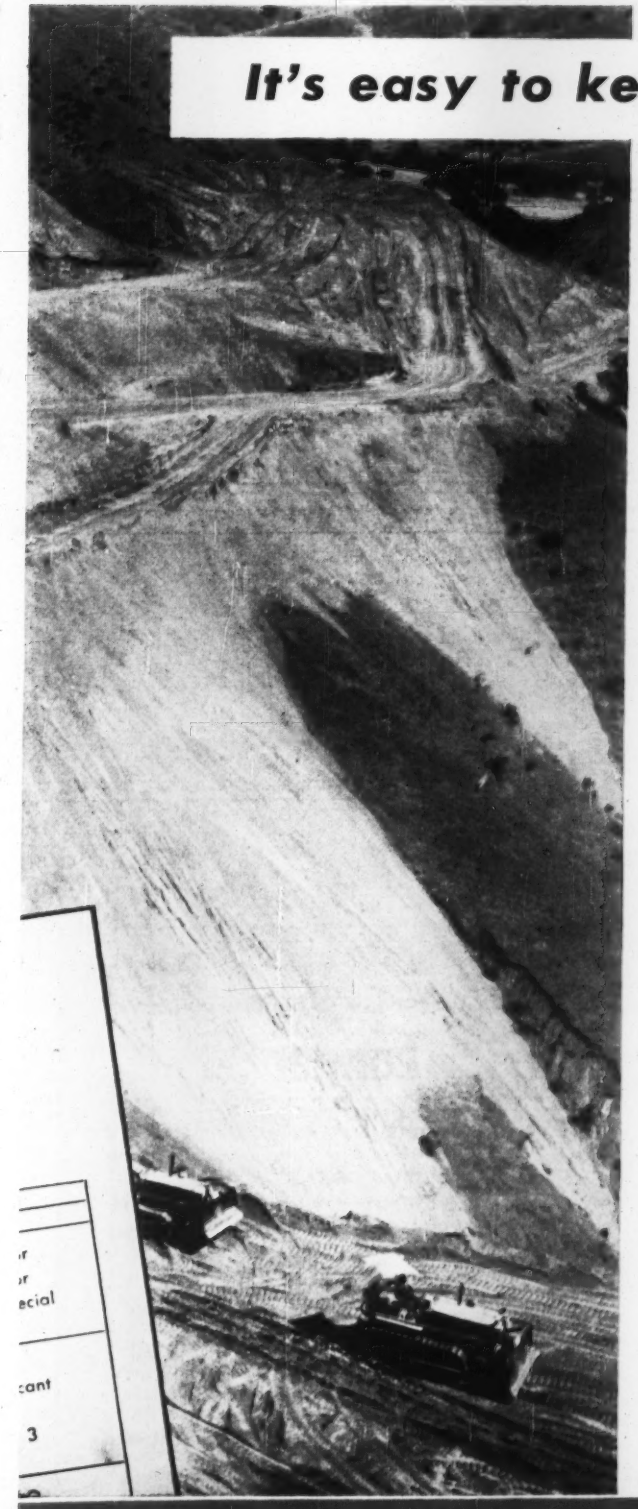

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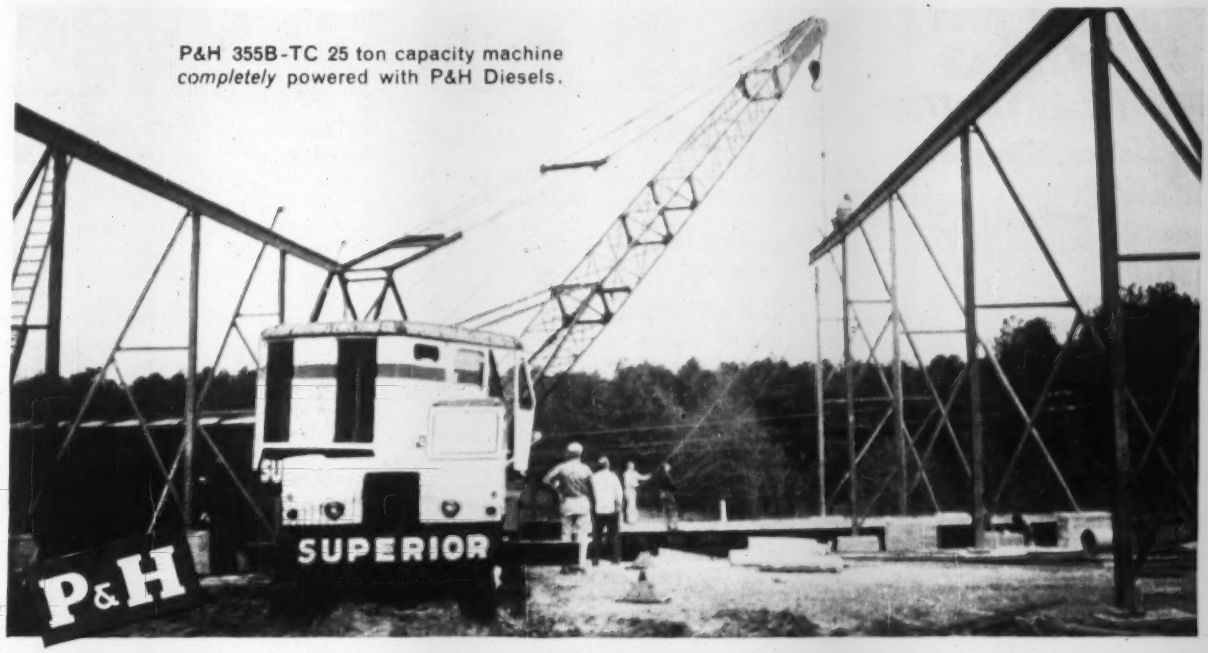

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- Saves clean-up after curing is done
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Reader Comment

Takes Professionals to Task

SIR—In ENR Mar. 7, p. 9, you published a letter from William A. White in which he states: "The classification of Highway Engineering Associates gives to the engineers in the Division of Highways not qualified technical assistants but non-qualified competitors." This implies that the Highway Engineering Associates now working for the division of highways are not qualified.

Most of these men have been doing work on the associate highway engineer level for many years. Upon what basis then does Mr. White assume that they are not qualified? If they are not qualified how were they able to pass written examinations covering specifically highway engineering of the associate level?

Mr. White goes on to state "This is not the only field of state engineering operations where the engineers have less to say about their way of doing things than do outsiders." Mr. White is not accurate in this statement. The examinations which the highway engineers are given are compiled from questions concerned directly with highway engineering work and which I believe are suggested largely by the highway engineers themselves.

Not many years ago an ambitious and intelligent man could, and many did, start at the bottom in the engineering profession and by hard work and study work up to the position of resident engineer or higher. It was not uncommon for these subprofessionals to work for lower than the standard wage because they had hope for advancement. Today many professional engineers wish to deny this advancement and at the same time maintain the same low standard of pay. Young college graduates either do not want to do the dirty work at all or are willing to suffer it for only a short time. The less educated man finds he can make more money with the contractor and he has little hope of advancement, hence the shortage in the lower level engineering positions.

There was also a time when the amount of usable or quality work that a man produced was the true measure of his worth, rather than what he might produce someday because he held a college degree. In this forgotten past the graduate engineer started out at the bottom the same as the non-graduate. He was expected to advance faster and he usually did. This did not preclude the non-graduate from advancing to the limit of his ability.

In this now extinct age a licensed engineer worked in the field in which he was qualified and professional ethics prevented him from working in another and an engineer's seal was a respected emblem. Very few men, even licensed engineers, are omniscient, but this quality certainly would be a help for proficiency in all of the things which a professional engineer's examination implies that a person should be proficient in to become a licensed engineer.

The solution to the engineer shortage is simply for the professional engineers to return to realism. In this age of unions and wage adjustments men are simply not going to work for a low salary for several years without the possibility of advancement when they can start as an apprentice in a trade and in a much shorter time become a journeyman, which in most cases pays more than he can ever hope to make as a subprofessional engineer.

RALPH H. HOGE
Fresno, Calif.

What Price Power?

SIR—In your letters column of Mar. 28, George R. Wadleigh writes: ". . . Tennessee Valley Authority has spent large U. S. funds advertising its ability to produce electrical power very cheaply. . . . The 'New York Times' . . . quoted the millions that TVA had turned over to the U. S. Treasury but neglected entirely to mention the great amount it had taken out of the Treasury, and the lost interest and taxes that would have come from a privately owned plant."

Some additional data appear in order.

First, prior to construction of TVA, the federal government offered low interest loans to local utility companies to undertake the project themselves. They refused.

Secondly, after considering all factors —including lost taxes, interest and depreciation—Congressman Chet Holifield showed in his famous criticism of Admiral Morcell's Water Resources Report that publicly generated power sells profitably below the level of private power. As a result, former Federal Power Com-

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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Your nearby Alcoa sales office has the complete story on Alcoa® Aluminum Industrial Building Products: how they save... how they last... why they're a sound investment. You can also get from Alcoa the names of approved aluminum applicators who offer complete service in the supply and erection of aluminum building components and a sample of the new Alodine finish. Aluminum Company of America, 862-E Alcoa Building, Pittsburgh 19, Pennsylvania.

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How to Make a Plumb Board for Easier Layouts

"A couple of years ago, windy days, green rodmen and terrain hazards were slowing up construction layout," recalls George Guesmer of Minneapolis. "Reference points were hidden from the transitman by brush, dirt, concrete and construction materials. With the plumb bob swinging in the wind, accurate work became impossible.

"I solved all the problems by making a plumb board. To make one yourself, obtain a builders' three-way plumb and level (used in making an ordinary mason's level) and a piece of plywood ½-inch thick, 48 inches long and the width of the plumb and level (generally three inches). Drill three one-inch holes in the plywood to permit observation of the level bubbles from the rear of the plumb board. Paint the plywood with a couple of coats of flat white.

"After the paint has dried, use black waterproof drawing ink and a ruling pen to draw a line lengthwise down the middle of both sides of the plywood. Graduate the ends of

Guesmer plumbing back of obstruction (left); offsetting.

the board in inches—or tenths, if you prefer. The alternating black rectangles make it easy to see the vertical line at a distance. To preserve the inked lines and to keep the board clean, spray the entire board with a clear plastic or brush on a clear spar varnish.

"I found my homemade 48-inch plumb board easy to handle and adequate for most work. It's especially handy for offsetting a reference line or measuring a short distance. I have run many an accurate, trouble-free mile of line using my plumb board, Gurley transits and Gurley levels."

"The Surveyor's Notebook" collection is packed with valuable tips like these. More than 40,000 engineers and surveyors are finding them helpful. Write for your free copy... At the same time, why not send us your own story?

Variable Power, now standard on all Gurley transits and levels, permits wide range of magnification with *one* eyepiece. Change your magnification to suit weather and light conditions. Built-in haze filter. Write for "Facts on VP."

W. & L. E. GURLEY
Union Plaza, Troy, N. Y.

GURLEY Surveying and Scientific Instruments

mission Chairman Leland P. Olds points out that private power rates now depend on the distance from public projects: the closer to TVA or similar installation, the more nearly the TVA rate prevails.

Finally, it is worth noting that large industrial power consumers such as steel plants, aluminum plants and oil refineries frequently find it more economical to generate their own power than to buy it from utility companies. Admiral Morcell's own Jones & Loughlin Steel Co. falls in this category.

SAMUEL SCHIFFER
Philadelphia, Pa.

Source Liked Story

SIR—I have read your article on the Pittsburgh sewerage project in the April 11 issue of ENGINEERING NEWS-RECORD, and I think you did an outstanding job both from the literary and photographic standpoint. Your selection of the photographs and captions, I believe, gave a very accurate picture of the conditions being encountered. Congratulations!

J. F. LABOON
Chief Engineer
Allegheny County Sanitary Authority

Name Added

Sir: I do not understand why Engineering News-Record should publish an article about an important engineering project (The Walt Whitman Bridge, ENR April 4, p. 52) calling it "the world's eighth largest suspension span . . . (which) . . . is more than an engineering feat" . . . without giving credit to the designers.

Charles S. Whitney
Ammann & Whitney
New York

EDITOR'S NOTE—Designers of the bridge for the Delaware River Port Authority were Amman & Whitney and Modjeski and Masters. ENR's story was intended to stress the economic and social impact of the new bridge, and so names of all participants, excepting that of the owner, were omitted.

Surveyors Are Engineers

SIR—With reference to "Are Land Surveyors Engineers?" (Mar. 21, 1957, p. 34), words are ultimately defined by court decisions, and eventually those definitions are expressed in dictionaries and must be accepted by laymen. Witness the voluminous Words and Phrases Section of any major legal library.

In 1926 the validity of the 1921 Pennsylvania Engineering Practice Act

ROAD-BUILDING VETERAN PROVES

BEST EQUIPMENT, WELL MAINTAINED, PAYS OFF BEST

GOODYEAR IS THERE!

▲ MILLION-DOLLAR ARRAY of equipment like this takes $7,000,000 relocation job on U. S. 21 in stride. This is just one of the many highway and airport grading and paving projects in Frank Mashuda Company's long and successful history. Tires shown are wide-base Hard Rock Lug by Goodyear.

◀ TYPICAL ON-JOB SETUP includes huge Quonset maintenance center and 2-way radio facilities. All vehicles and tires are kept in A-1 working condition at all times, on every job—and when no longer needed are returned to central maintenance center for general inspection and reconditioning. This has paid off, through the years, in one of the lowest down-time overheads in the industry.

80% of earth-mover tire down time ended by Goodyear

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Tubeless or Tube-Type!

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SURE-GRIP LUG

ROAD LUG

GOODYEAR TIRES

Look for this nearby Goodyear dealer sign for better tire values—better tire care.

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CONTRACTORS REPORT that as much as 80% of tire down time is due to tube and flap troubles.

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was challenged by a county court decision which held the act to be in violation of the state constitution by including legislation for two "subjects" viz. engineering and surveying, within one statute. The attorney general, representing the Registration Board for Professional Engineers, petitioned the Supreme Court of Pennsylvania for a decision.

The court realized that the relatively new application of the professional doctrine to engineering practice had a vitally important bearing on promotion of "the common welfare". Consequently, in 1927 the court rendered a critical examination of the entire law (Commonwealth v. Humphries). The original decision is strongly recommended for reading by every engineer as it presents a clear picture of the court's high opinion of the profession that is not evident in the usual "digests."

Briefly, the court defined surveying as a branch of engineering and, therefore, a proper subject for legislation in an engineering practice act. This means that the courts will not accept subsequent propositions that attempt to avoid responsibility for "life, health and property" by lay refinements of the definition of "surveying". Carrying such devious thinking to a comparable conclusion might suggest consideration of the proposition that mathematics is not a part of engineering.

G. E. Geyer
c/o UNKRA,
(APO 301, San Francisco)

No Steel Saved

Sir—In the article, "Plastic Design is Used Successfully" (ENR April 11, p. 59) the claim is made that the plastic-design method resulted in appreciable savings in the weight of steel required compared with a simple-beam elastic design. The same claim could be made for an elastic design based on continuity.

Approximately the same savings would accrue if full advantage is taken of the 20% increase in allowable stresses at the interior supports as permitted in Sec. 15 (a)(3) of the American Institute of Steel Construction specifications. A judicious use of cover plates in any design would result in additional savings in the weight of steel required, but the added cost of fabrication would strongly tend to nullify the monetary savings.

Plastic design methods result in the selection of beams, which under working loads are stressed to levels at least 15% higher than the usual allowable stresses, and so, of course, "savings"

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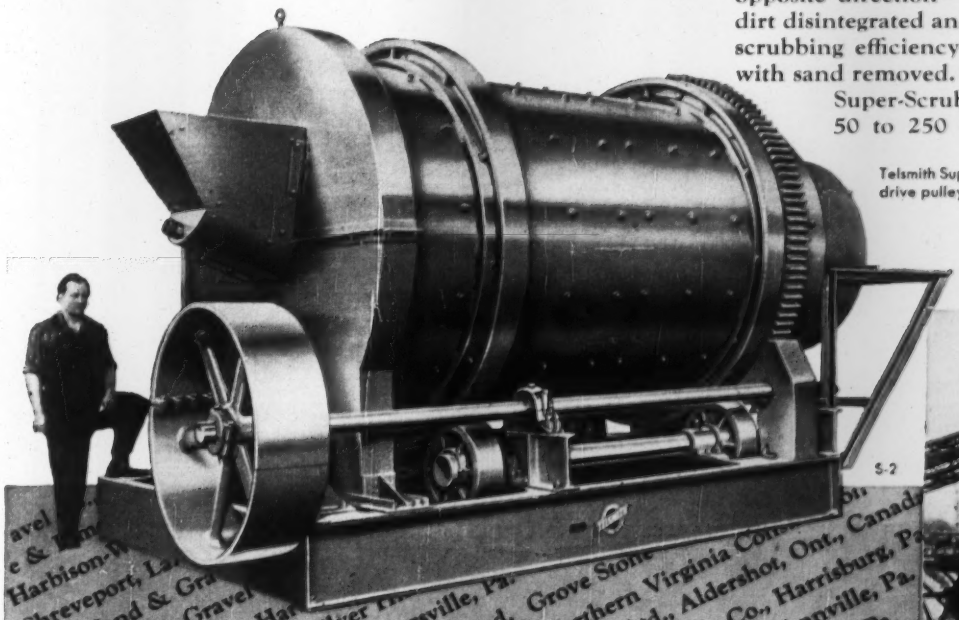

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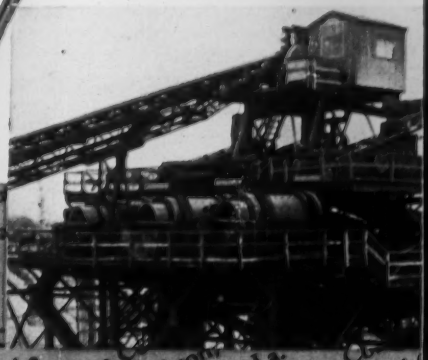
Three of the five 60-inch diameter Telsmith Super-Scrubbers in Colonial Sand & Stone Co., Inc. plant, Port Washington, New York.



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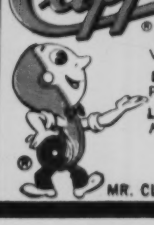

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over a simple-beam design are achieved.

There is no doubt that plastic design methods can save time for the design engineer, but if recommended load factors are employed, no savings in steel should be expected.

E. Guillard
Research Engineer
Armour Research Foundation
Chicago, Ill.

Editor's Note—The 20% stress increase in the code is an interim provision adopted in recognition of the plastic behavior of continuous steel beams pending development of a satisfactory plastic design theory. It remains to be seen whether this provision will be retained unchanged.

Facts Wrong

Sir—The inaccuracies contained in the report on the AGC Convention in Washington this month as published in Engineering News-Record for Mar. 21 have obliged us to issue a memorandum to the membership of the National Electrical Contractors Association concerning pages 25-26 of that issue.

No one has proposed to the Congress within the past 20 years any legislation providing for separate contracts on federal public works. The five (correct) bills before Congress are simple sub-bid listing measures as were previous proposals since 1952. Sponsors never proposed nor intend to propose separate contract legislation on federal public works.

We, of course, have no objection to your opposing this legislation, but we think that you should be accurate on the basic facts.

George B. Roscoe
Director of Public Relations
National Electrical Contractors Assn.

Editors' Note: There is now unified construction industry support for the Federal Construction Procedures Act, with both specialty and general contractors backing the measure, as reported in ENR's Mar. 21 account. Favorable Congressional action on the measures is expected shortly.

CALENDAR

American Institute of Architects, Centennial Celebration, Sheraton-Park Hotel, Washington, D. C., May 14-17.

Column Research Council, annual meeting, Lehigh University, Bethlehem, Pa., May 15-16.

Jet Age Airport Conference, ASCE Air Transport Division, Park Sheraton Hotel, New York, N. Y., May 15-17.

Society of American Military Engineers, annual meeting, Mayflower Hotel, Washington, D. C., May 20-21.

American Institute of Steel Construction, Ninth Annual Engineering Conference, Edgewater Beach Hotel, Chicago, Ill., May 27-28.

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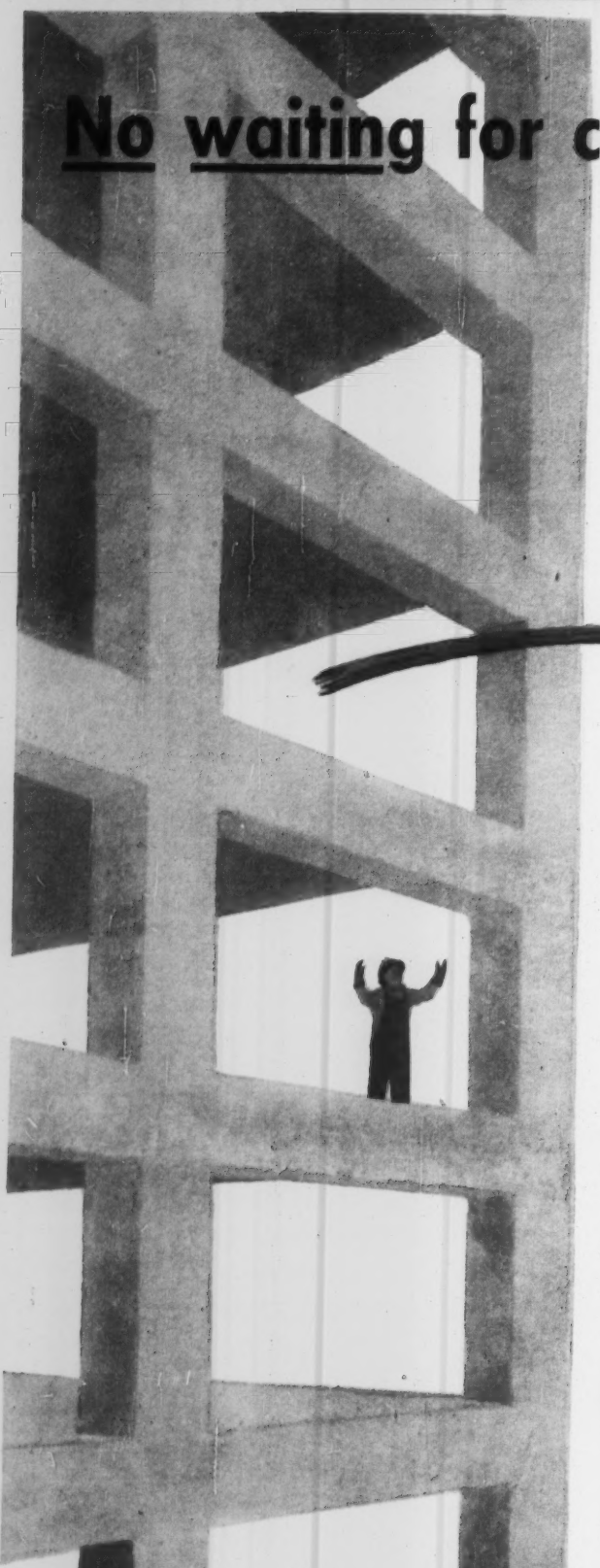

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THE CONSTRUCTION WEEK

MORE DANGER AHEAD—New heavy rains are building up another disaster situation in a section of Texas, warns the Corps of Engineers. Flood potential of a drastic degree comes from the fact that even during the slack period following the April torrents, Texas received enough rains to keep up channel and some valley storage.

WATERWORKS APPROVAL STAMP DELAYED—A plan, for certification of materials and equipment, which the American Water Works Association had approved in principle in January (ENR Feb. 7, p. 17) and had come to Atlantic City this week to finalize seemed headed for trouble as the 77th Annual Convention started this Monday. As the hottest issue of the meeting for many in attendance, the scheme was reportedly in its fourth version with still more tough sledding due on presentation later in the week. Idea is to protect AWWA members from inferior or questionable materials by using a seal of approval on all approved (by AWWA) products. One problem is a legal one: The certification program could be held in restraint of trade by the Department of Justice.

ONE OF THE BIGGEST FALLS—A sudden rain which fell in Detroit on Friday, April 10, probably saved several men from injury or death. Minutes after the ground crew of one of the country's largest crane-mounted pile drivers had ducked into a shanty to stay dry, the top section of the rig's 186 ft leads collapsed. The falling section started a chain reaction that dropped 40 tons of steel backward and to the side. Three men were trapped but uninjured in the cab of the machine.

At the time of the collapse, the pile driver had sunk more than 4,500 100 ft piles for the foundation of a new Convention Hall Exhibits Building—77 more piles remained to be driven. An unnoticed break in one member of the lead tentatively has been blamed for the collapse.

FROM HAND TO MOUTH—Work on Ice Harbor Dam may stop next week if additional funds are not allocated by the Corps of Engineers. One threatened shutdown on May 10 was averted when $925,000 was paid out for the $135 million project on the lower Snake River in Washington. But at the current rate of progress that amount is figured to last only until May 24. If more money is not forthcoming at that time, the contractor may either shut down until new fiscal-year funds are available on June 30, or continue operations with his own funds.

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WASHINGTON OBSERVER

- **Bid-shopping law may pass**
- **Federal lease-purchase alive again**
- **States may supply lease-purchase funds**
- **Housing decline seems stalled**

● **Chances are looking up for a bid-shopping law this year.** There's been compromise language written into a preamble which has ended the opposition of the Associated General Contractors—who up to this year have led the fight against the proposal. The language says, among other things, that the "general contractor is solely responsible to the government for completion and has undivided responsibility."

This eliminates fear of the general contractors and government procurement officials that the prime contractor would be hamstrung and lose control of the job. Also, there was fear that government agencies would eventually wind up taking separate bids from the specialty contractors.

The legislation requires the prime contractor to list his subs when he submits his bid. And, after he gets the award, he may not switch subs without prior notification to the contracting agency. It has other provisions covering such things as primes doing their own specialty work; situations in which no specialty bid has been received by the prime; failure of the sub to meet requirements; and other special situations.

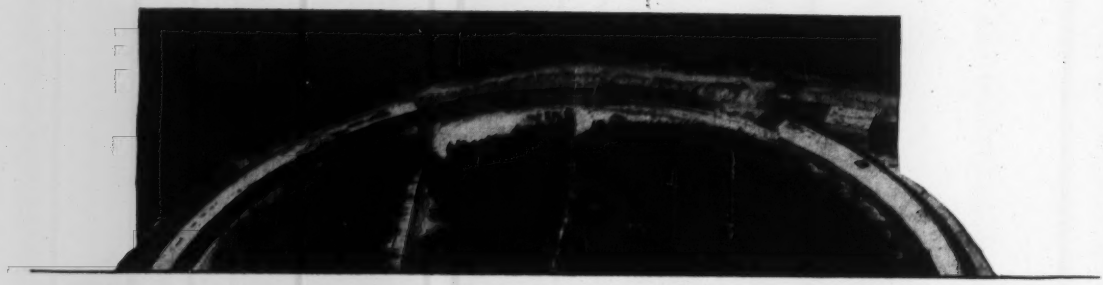
● **Lease-purchase is going to be given another try.** General Services Administration officials have been studying their money prospects during the past three months since they called a temporary halt to any further bid advertising. When they stopped, they had managed to get under construction only one building out of nearly $700 million approved by Congress.

GSA officials say they see easing in the money market and construction labor becoming more available in many localities.

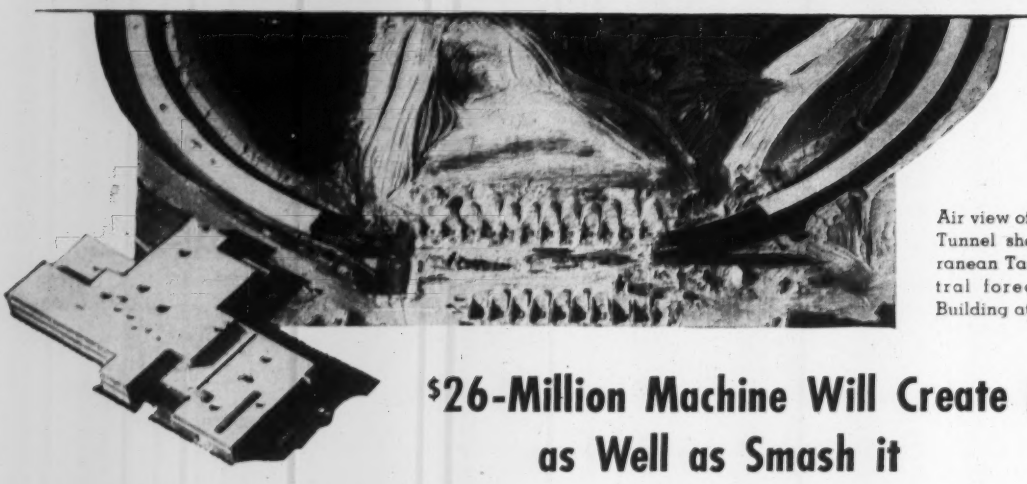
By the end of this year, they hope to advertise 39 buildings totaling about $71 million. GSA is changing its methods of operation: It will sound out investors before advertising for construction bids; no bids will be asked unless GSA officials are satisfied that the financing of the project is fairly certain. They feel that long-term 4% money will be available.

● **Some states are moving to supply lease-purchase money themselves or through their cities.** They are authorizing either new or existing agencies to raise the money to finance the lease-purchase building—in other words, these agencies would fill the role of the private investor. The theory is that the state or local bonds, being tax-exempt, will be easily marketable, thus breaking the major bottleneck that has prevented much-desired federal buildings being built in their cities.

● **The housing decline may be coming to a halt.** The housing starts for April went up to 92,000 over the 83,000 in March. That, seasonally adjusted, means that in April the annual rate was 940,000, against an annual rate of 888,000 in March. But, and the but is big: A year ago the annual rate was 1,157,000. So, though the downturn may be stopped, the housing industry is still going to be soft throughout the year. Efforts to stimulate home-buying and homebuilding in Congress are still modest (see page 167).



ATOMIC RACE-TRACK



Air view of Magnet Enclosure Tunnel shows site of subterranean Target Building, central foreground; Service Building at left.

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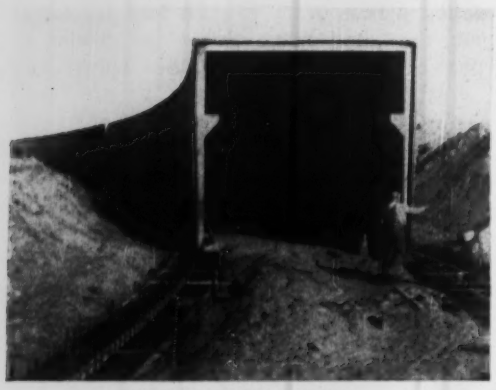

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- **Improve products by spotting weaknesses**

Plugging the Holes in Specifications

Construction men have good reason to wish success to an effort made this week in Washington. The Construction Specifications Institute, an organization devoted exclusively to improving construction specifications, got together in the capital to tackle the problem of working smoothly as a nationwide team.

Although the meeting this week was officially CSI's first national convention, the association is not exactly new. It has been in existence 10 years. Organized by specification writers working for the federal government, it jogged along at an easy pace until a short time ago.

Last year, CSI members attending the Los Angeles convention of the American Institute of Architects staged an impromptu CSI convention and since then things have been moving rapidly. The organization has virtually doubled both its chapter and individual memberships in the past year.

There are 16 chapters now, with five more either forming or being planned. And individual memberships total about 1,600 against less than 1,000 a year ago.

With such a membership record, CSI undoubtedly rates as one of the fastest growing organizations in the construction industry. However, its ultimate importance will not be based on numbers or growth rate but rather on the influences it can bring to bear on the industry that gives it cause for being. These can be considerable.

• **Office boy can't write specs**—Going on the premise that specifications exercise a major influence on construction quality and costs, CSI wants to make specs a major factor in design. The chief operating officer at the society's Washington headquarters, Secretary-Treasurer Harry C. Plummer, puts it this way: "As construction becomes more complex, no one guy can be an expert in all its phases. Specification writing is a job for highly trained people. It's no longer a job for the assistant to the office boy. And part of our job is getting full acceptance for that idea."

If CSI is successful, construction specifications will be a specific order from the designer to the contractor. At present they fall far short of that quite frequently.

An example of the kind of looseness that CSI hopes to eliminate was related by the chief engineer of a big New York City contracting firm. On identical phases of one job, which he said was in the behemoth category, six subcontractors working from the same contract documents turned in proposals that might have been prepared from six different sets of specifications. This could have been avoided, he pointed out, had there been adequate standards and practices agreed on and established beforehand by the men in the specifications end of the business.

• **Society members benefit too**—CSI also has a secondary objective. Like other professional societies, it wants to gain recognition for those it represents. CSI is going to establish, to quote Mr. Carl M. Mann, a member of the organization's editorial committee, "a new front in architecture."

Spec writing, flowering as a recognized profession, is aided by what Mr. Mann calls "the fact that the architect's long historic practice of jointly plying two dominant skills—artistic and scientific—is getting out of balance.

"Science and engineering are simply becoming too complex," he adds, "in both construction and the manufacture of materials. No longer can the architect expect to be complete master of both science and art. Consequently, he must move over and make room for the engineer and specification writer to balance the scale."

• **No jealousies in CSI**—Building is a big roomy industry, and if there are professional jealousies in CSI, they are deeply submerged. The society is drawing its membership from all professional groups interested in specifications—principally, architects, engineers and manufacturers of building materials.

CSI considers its closet relatives to be the 100-year-old AIA and the 55-year-old American Society for Testing Materials. At the moment AIA and CSI are involved in a joint technical study on the possibility of launching a specification service for industry and their own members.

• **Top men**—CSI's current President is Mr. J. Norman Hunter of Los Angeles, an architect and specifications consultant. He turned consultant when he saw the building boom beginning, judging correctly that swamped architects and builders would need expert guidance on specifications.

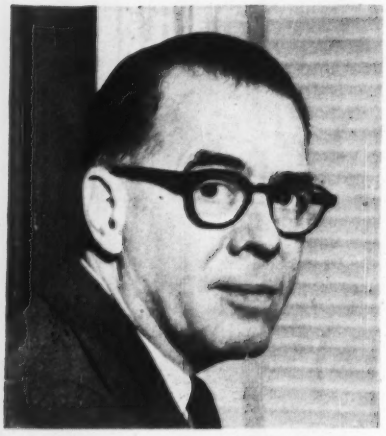
Second man in the CSI command is Vice President J. Stewart Stein, a Chicago architect. He is regarded as the sparkplug in CSI's recent big expansion. Two months ago, much to Mr. Stein's delighted surprise, he was instrumental in a chapter formation that occurred, complete to dues collection, in a single evening. He and Mr. Carl E. Heimbrodt, Secretary of the Chicago Chapter of CSI, met with a group in St. Louis to outline the society's aims. At the conclusion of the talks the group elected temporary officers, formed three committees, and collected chapter and national dues on the spot.

Mr. Plummer, as Secretary-Treasurer, runs CSI's day-to-day affairs in the Washington office, which is housed in the four-story building of the Structural Clay Products Institute. CSI has only a small paid staff, all secretarial. Like its other executives, Mr. Plummer draws no salary from the organization. He

. . . CSI: Nobody pushed for a long time

J. NORMAN HUNTER, Los Angeles consultant on specifications, is CSI President.

J. STEWART STEIN, CSI Vice President, sparked last year's membership drive.



HARRY C. PLUMMER, Washington engineer, is CSI's chief operating officer.

cains his living as director of engineering and technology for the Clay Products organization.

Despite the housing arrangement, there is no affiliation of CSI and SCPI. CSI does not, and will not, fight Clay's battles in the market place, Mr. Plummer declares, but operates as an independent group with but one objective —overcoming weaknesses in the art of specification writing.

Functioning as the administrative affairs committee, the top trio—Messrs. Hunter, Stein and Plummer—handle CSI affairs subject to the control of a 10 man board of directors.

• **No claims yet**—CSI makes no claim to past great accomplishments. "The biggest thing we can point to now," Mr. Plummer concedes, "is simply getting organized to do this job. We were organized and incorporated in 1948, but until the last couple of years I'm afraid our light was more or less kept under a bushel and nobody worked much at pushing the CSI.

Several projects, however, are in the CSI mill now. The Metropolitan New York Chapter, for example, is working on standardized nomenclature—an assignment handed out by the CSI National Technical Committee. After the New York report comes in, it will be passed along to other CSI chapters across the nation for comment and suggestions. Eventually, the society will publish a glossary and if all goes well, it will become a standard reference for the entire construction industry.

It is normal procedure in the CSI for local chapters to function as task forces on various projects. Some jobs are assigned from national headquarters. Other projects are undertaken by the individual chapters working on their own initiative.

The society has other projects under way bearing on techniques in the so-called "trade sections" of specifications —on masonry, concrete, metalwork, carpentry, and hardware.

• **Engineer participation invited**—Eventually CSI plans to go into engineering specifications in such areas as highways, dams and waterworks. For this, more participation on the part of engineers will be needed, and it is one of the society's immediate goals to make more active alliances with the various engineering societies.

CSI has two classes of membership: Active, for persons engaged in writing specifications; and Associate, for persons interested in specifications. The society solicits technical representatives of building-products manufacturers as associate members.

Mr. Plummer sees CSI contributing heavily in the future to improved building techniques. The society may funnel information on shortcomings of building materials from the construction people to the manufacturers. He emphasizes, however, that CSI will concern itself only with the fabrication and assembly of materials—not with the nature of the materials.

• **Nationwide influence**—CSI chapters are active now in all but four of the 15 biggest cities, and plans are under way to organize in those four—Pittsburgh, Houston, Buffalo and Minneapolis-St. Paul combined.

Heavy construction, the areas where the chapters are active, probably amounts to 75% of the U.S. total. Thus the sphere of influence is big.

Moreover, Mr. Plummer says, CSI is in a prime position to tap the wealth of information possessed by its members and distribute it widely. The society now publishes a quarterly journal, "The Construction Specifier," and aims eventually to turn it into a bi-monthly or monthly.

• **Future of CSI**—Getting its work accepted is a bridge CSI hasn't crossed yet. There's the journal for publicizing it, Mr. Plummer points out, plus other means. And he envisions CSI specifications in published form somewhat like those of ASTM standards.

Mr. Plummer sees a bright future for the CSI, founded solidly on the society's economic value to the industry. "We have had many contractors talk to our groups," he says. "Invariably they tell us that well organized definitive specifications enable them to bid lower prices. And, if in doubt, they always have to put in contingencies to cover what they think the specification writer meant—items that are either poorly defined or not defined at all.

"We do not believe in, do not want, canned specifications," he emphasizes. "But we do believe in standard methods and standard definitions, so that a contractor reading a requirement in one specification will know it means the same thing as in another contract out of another office—if the requirement is worded the same way."

Water Tunnel Contract Goes to the Low Bidder

Contract has been awarded to the joint venture West Delaware Tunnel Constructors for the remaining 20 mi. of the New York City Board of Water Supply's 44 mi long West Delaware water tunnel to tap the Delaware River. WDTC's total low bid for the two-contract remainder was $43.9 million, $250,000 lower than the next low (ENR May 2, p. 28).

High Cost of Building

New York bridge projects run 100% over estimates

New Yorkers got a rather startling demonstration of what has happened to construction and land costs in urban areas during the last two years this week, as public hearings began on three major traffic-relief projects that will now cost nearly 100% over what they were to cost in 1955.

The projects concerned are the long-planned second-decking of the George Washington Bridge across the Hudson River; the new Throggs Neck Bridge to connect Long Island and the mainland in the Bronx, and the huge Narrows Bridge between Brooklyn and Staten Island.

According to the Triborough Bridge & Tunnel Authority and the Port of New York Authority—joint sponsors of the overall plan—total cost of the three structures and their approaches will be $715 million. Early in 1955 (ENR Jan. 20, 1955, p. 28) when the projects were first formally proposed by the two agencies, the estimated price tag was set at $379 million.

Most of the added cost is accounted for by skyrocketing costs of building approaches to the structures in heavily congested urban areas, including the cost of acquiring extremely valuable land and clearing structures.

In detail, the price tag costs of the structures and their approaches were set down this way:

- The Narrows Bridge—to contain a 4,400 ft suspended span that would make it the world's longest by about 200 ft—would cost a total of $407 million, of which $300 million would be for the bridge alone, $107 million for approaches in Brooklyn and Staten Island.
- Second-decking the George Washington Bridge (originally planned to carry rapid-transit trains on a lower level) is estimated to cost a total of $182 million, including $25 million for work on the bridge itself, $157 million for New York and New Jersey approaches.
- The Throgg's Neck Bridge—a 5,200 ft long suspension structure—would cost $126 million, of which $71 million would be the cost of the bridge itself, $55 million the cost of connections in the Bronx and Long Island.

For comparison—in their 1955 report, the two agencies listed estimated costs this way: Narrows Bridge—total cost $204 million, $74 million for approaches; George Washington Bridge—total cost $82 million, of which $62 million would be for approaches; Throgg's Neck Bridge—total cost $93 million, including approaches.

The public hearings being held this week are preliminaries to approval by the city's Board of Estimate, and by the City Planning Commission. Officials of the sponsoring agencies pointed to rising land and construction costs—and to added expenses caused by many additions to the projects since their inception—as reasons for the huge rise in total cost.

The PNYA and TBA would build the structures themselves out of their own bond-backed capital. Approaches would be part of the 90-10 federal interstate highway program.

Partnership Stymied

Trinity project proposal questioned on power costs

The partnership proposal for development of the Trinity River Project in California has hit an obstacle. Last week, Interior Secretary Fred A. Seaton asked the House Interior Committee to hold up action on a partnership bill because some of the original supporting data appeared to be in error.

Committee chairman Rep. Clair Engle of Calif., to whom Secretary Seaton's letter was addressed, promptly raised the question of the validity of the other supporting data for the partnership proposal that the secretary had furnished.

Secretary Seaton recommended partnership between the Bureau of Reclamation and Pacific Gas & Electric Co. to the President and Congress on Feb. 12. The arrangement would provide for PG&E to buy the falling water from the $225 million Trinity Dam, install and operate the 384,000 kw capacity electrical generating facilities for 50 years, and pay to the government $4.6 million a year.

This arrangement, the Interior Department said, would mean a surplus of $165 million in project revenues over the 50 years as compared with all-federal operation.

A few weeks ago the House Interior Committee wrote Secretary Seaton asking for backup data on the various figures he used to bolster his stand on the desirability of the partnership approach.

In particular, the committee questioned Interior's figure of $86 million as the increased cost of power to preference customers from the partnership plan as against the federal plan over the 50 year life of the contract. The committee contended their calculations showed the figure should be closer to $200 million.

Therefore, they asked the Secretary to furnish them with all the data that went into determining the $86 million figure, this would include such items as number of customers, assumed costs, load factor, and other pertinent facts.

In response to this request Secretary Seaton now has told the committee that "certain data" furnished him by the Bureau of Reclamation's regional director "appears to be in error."

The bill now before the committee was sponsored by Rep. Hubert B. Scudder and calls for the partnership proposal Interior Secretary Seaton recommended.

The committee also is questioning the figure of $135 million that Secretary Seaton says would be paid in local, state and federal taxes over the 50 year life of the contract.

Windstorm Speeds Up Expressway Plans

A 90 mph gust of wind that recently blew the 604-ft long Lake Steamer Champlain into the Fassett St. Bridge over the Maumee River in Toledo turned out to be anything but an ill wind for the city's extensive expressway program.

Trucks had been banned from the structure for several years, but about 12,000 passenger cars used it daily and city officials had planned a new bridge—part of a $37.7 million expressway program—for completion in 1964. With the structure out of service, plans were hastily revised by Howard, Needles, Tammen & Bergendoff, Kansas City consultants, and the new bridge now will be finished by 1960.

Right-of-Way Rumpus

Four officials indicted in Indiana road scandal

Four former officials of the Indiana State Highway Commission have been indicted for alleged irregularities in right-of-way acquisition for the state highway program, in a widening investigation into what may be the first major scandal in the new federal-aid highway plan.

Indicted at Indianapolis were Virgil W. Smith, former commission chairman; Nile Teverbaugh, former chief of the right-of-way division; Robert A. Peake, a Milan, Ind., attorney, and Harry Doggett, who was chief right-of-way buyer under Mr. Smith and Mr. Teverbaugh.

All four are charged with conspiracy to embezzle public funds in particular connection with purchase of two "back lots" in Indianapolis to clear right-of-way for the proposed Madison Avenue Expressway. According to local accounts the deal involved purchase of land for $3,000 that eventually was sold to the state for $25,800.

• **Repercussions** – The scandal – widely publicized in local newspapers, has already spelled real trouble for the state.

First move was action by the Bureau of Public Roads on April 15, when BPR cancelled its participation in right-of-way payments to the state, pending a review of the situation by the Bureau. Last week, B. D. Tallamy, federal highway administrator, said that payments would be resumed as soon as certain information requested from the state have been received and reviewed.

Meanwhile, the U. S. Senate Public Works Committee–watchdog of the road program–sent its own investigators into Indianapolis to check into these charges and others concerning irregularities in land acquisition, and local newspaper charges of other scandal connected with the highway program.

And as far away as Tennessee, highway officials felt moved to announce that they were taking "every precaution" to prevent such occurences. W. M. Leech, highway commissioner, reported that he had directed new procedures in right-of-way purchase that include:

Appointment of two appraisers–one employed by the state, and one appointed by local authorities–to determine value of land; employment of a buyer after the land has been appraised.

A departmental check of all records so that the department is advised as to when each plot was bought and how much was paid.

Basin Compacts

One more born in West; another seeks changes

Another river basin came under the regional development principle recently when the governors of California and Oregon signed bills to ratify the Klamath River Basin Compact. The purpose of the compact is to promote orderly and comprehensive development and use of the water resources of the Klamath River basin, which lies in both states.

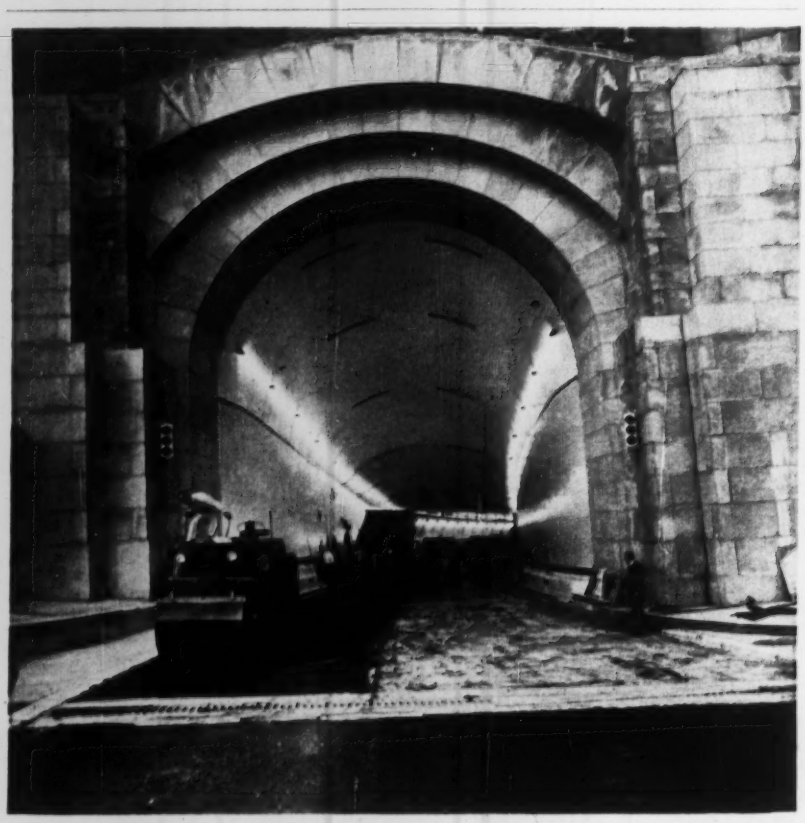
The compact provides for preferential rights for use of the water, recognizing currently vested rights. It establishes rules for future acquisition of rights in either state, with the law of the state in which the water will be utilized applying.

Domestic use of water is given first priority and irrigation second. These rights will retain priority over all other uses in future rights, regardless of date of application.

The compact commission will cooperate with other state and federal agencies in abating and preventing pollution of the river. The agreement is to be presented to Congress for final consent.

• **Columbia compact**–The Columbia Interstate Compact Commission has announced it will receive new amendments until May, 1958, on its proposed agreement to cover water resources develepent in the Pacific Northwest. The compact, approved last December by commissioners from Washington, Oregon, Idaho, Montana, Wyoming, Utah and Nevada, is yet to be ratified by state legislatures.

Provisions of the compact cover power, irrigation, navigation, pollution, fisheries and other matters pertaining to the water resources of the Pacific Northwest.



Finishing Touch for the Third Lincoln Tube

Finishing touch for the Port of New York Authority's $100 million Third Tube to the Lincoln Tunnel was the week-long job of placing asphalt wearing surface, just prior to the official tunnel opening May 25.

The 8,000 ft. 2 lane roadway was paved with a 4½ in. asphaltic concrete surface, bonded to the reinforced concrete roadway base. Standard Bitulithic Co., Newark, N. J., rushed its crews into the narrow working space between 6 p.m. and 6 a.m. each day to be out of the way of other last-minute workers.

Seaway Channel

One low bid, one negotiated contract and rest is do-it-yourself for Corps

Corps of Engineer participation, a low-bid contract award for $2.3 million and a $3.8 million negotiated contract, will be the means for dredging the South Cornwall Channel of the St. Lawrence Seaway. These three phases for providing a 14 ft navigation channel by July 1958, and 27 ft by April 1959, appear to be the solution following rejection of low bids for the job that totaled $18 million over the Corps' estimate of $14 million (ENR Mar. 21, p. 21).

The Corps' dredge Gaillard, which normally operates in the Great Lakes, will be put to work in the South Cornwall Channel by June or July of this year. The Corps, as construction agent for the St. Lawrence Seaway Development Corp., also has negotiated with and is about to award a $3.8 million contract to Merritt-Chapman & Scott Corp. for excavation of 500,000 cu yd of material in the channel below Roosevelt Bridge. An additional $400,000 will go to the firm for removal of an old submerged steel bridge span below the new Roosevelt Bridge.

The $2.3 million low bid—slightly below engineers estimate—by S. J. Groves & Sons, Minneapolis, was the only one not rejected by the Corps. Awarded contract calls for excavation of 1.8 million cu yd of earth with dry land equipment in the Raquette Point section of the channel.

Part-Time Draftsmen

Boeing leases building near campus to use engineering students

The Boeing Airplane Co. has leased a building with 6,000 sq ft of floor space near the University of Washington campus in Seattle in a move to increase the use of university engineering students for non-classified drafting work.

After their freshman year, engineering students will be hired on a part-time basis, and paid according to a sliding scale.

"Farming out" of some routine work will enable company engineers to devote more time to technical phases of their work, the company said. Engineering students will gain experience and the jobs will help defray college expenses.

Boeing previously has used engineering students but the students always were required to work in existing company facilities, some distance from the campus. The new job locations, just off the campus, are expected to be more attractive to the students.

Boeing is going to establish the same program at Seattle University, where 5,000 sq ft of space has been provided in the men's dormitory.

Final-Stage Bids Called For Rocky Reach Project

Bids for final-stage construction of its $250-million Rocky Reach hydroelectric project on the Columbia River have been called by the Chelan County PUD, for opening June 14 at Wenatchee, Wash.

Two contracts will be awarded, one for general work and the other for electrical. The general contract will include over 550,000 cu yd of rock excavation, 750,000 cu yd of concrete placement and installation of seven turbines and 12 tainter gates.

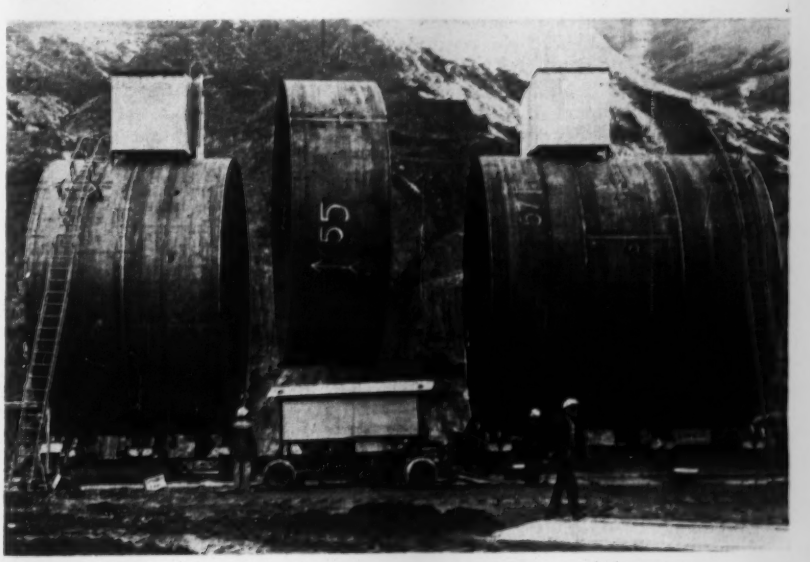
Placement of concrete has just begun on the first-stage construction, which involves seven spillways, ultimate power capacity will be 1 million kw.

Utilities Relocation Pay Gets Veto in Colorado

Colorado's Gov. S. L. R. McNichols has vetoed a bill that would have required the State Highway Department to reimburse utility companies for the cost of moving their facilities to make way for new highway construction projects.

The veto had been urged by State Highway Engineer Mark U. Watrous, who estimated the measure might have diverted $50 million in highway funds from road construction over the next 13 years.

"I am thoroughly convinced I am acting in the public interest," Governor McNichols said. "The fact that many highway users are also utility users does not detract from the self-evident argument that each service should, insofar as possible, be self-sustaining." The governor added that utilities that are quasi-public in character must add their costs of doing business to their rate structures and not assess part of their operation costs to the State Highway Department.



Penstock Liner Assembled Fast at Brownlee

A fast-moving penstock liner assembly line at Brownlee Dam on the Snake River is turning out 60 ft long sections of 24 ft dia liner at the rate of one a week. They consist of eight 7½ ft "cans" and vary in weight from 70 to 120 tons when assembled, depending on plate thickness (¾ to 1⅛ in.).

Liner sections are welded automatically inside and out, and checked by X-ray. Welding equipment is contained in the houses atop the section. B. Mark Johnson has charge of the assembly plant for Morrison-Knudsen Co., contractor for Idaho Power Co.

Drilling of four 540 ft penstock tunnels is nearly completion, at least far enough to allow the steel liner to be installed. They are being mined from the powerhouse end because the intake excavation will not be down to grade for another year.

As designed by International Engineering Co. of San Francisco, an M-K subsidiary, Brownlee will be a 395 ft high rockfill dam with an initial generating capacity of 360,000 kw. Crest length is 1,380 ft and total volume is 6 million cu yd, of which 5 million cu yd will be rock.

Rx for Engineer Shortage: *1. Summer Help*

- **Engineering students, college faculties**
- **Government recruits them more than industry**
- **High school teachers relatively untapped source**

A large supply of technical manpower is available to the construction industry for summer employment—but does the industry want it?

Some 75,000 engineering students who have completed two or three years of college will take on jobs during the summer months, according to estimates of the Engineering Manpower Commission. Engineers employed on college faculty staffs will go to summer jobs; high school teachers of mathematics and science comprise still another generally unrecognized source of temporary manpower.

Yet despite the shortage of trained technical help, there is no apparent clamor for these people by the construction industry.

An ENR spot check of universities and companies throughout the country indicates that engineering and construction firms trail far behind other industries in the employment of students for the vacation period. Federal and state agencies are more active.

• Government recruits for summer—A number of government agencies have definite programs for summer employment. Some of them, such as the Bureau of Reclamation and the Bureau of Public Roads, give college students conditional appointments in the lower grades starting as early as the freshman year. They then work up by steps to higher-grade permanent appointments upon graduation. Such programs have proved highly successful for some agencies in building up candidates for permanent jobs.

Employment of professors, college instructors and high school teachers is less planned, but a number of these people also will be working for the government agencies this summer.

The USBR hired 350 students as engineering trainees last summer. This year the the quota is set at 250, but actual employment figures may go higher.

The BPR expects to hire from 300 to 400 civil engineering students for highway location survey parties, as well as a considerable number of high school graduates. All in all, the bureau plans to employ about 1,200 people for summer work through its central, regional and district offices; the majority will be students.

In the fall, BPR is planning to start a definite program for recruiting college instructors for the following summer. This year they have obtained about a half dozen.

Similar hiring is being done by the 40 district offices of the Corps of Engineers.

State highway departments, which each year have faced the dilemma of attempting to recruit college graduates with low salary scales, have been using summer help for many years. It is estimated that 4,000 to 5,000 students will be employed by highway departments throughout the states in the coming months. The time engineering students put in with the highway departments during the summer qualifies them for higher salary brackets if they come in with the department after graduation.

• Firms recognize the possibilities—More companies than ever before are recognizing that summer jobs can be the handmaidens of recruitment for permanent personnel.

Several employers have been making summer employment part of the recruiting package that they offer the engineering student. Many take engineers between junior and senior years, while some start them at the end of the sophomore year.

Bechtel Corp. hires about a dozen civil engineering students each summer. Places are found for most of them as engineering aides in the office; a few are used for field engineering. The salary level is reported to be about $300 to $325 per month for engineering aides. Summer hires are not considered very profitable for a short-term basis, but they are highly satisfactory from a long-term recruiting point of view, says a Bechtel spokesman. The company also is considering the possibility of recruiting engineering teachers for summer jobs, with the idea of bringing them up to date on present techniques and methods, and to aid in recruiting students in the future.

Harza Engineering Co. employed 15 engineering students last year and plans on a similar number this year. They are used chiefly for drafting work and computation, and are paid according to ability and training. A college sophomore would get on the order of $365 per month, while a junior might get $395. The Harza firm reports the program is profitable both from a short and long-term point of view. The men earn their way as they go along and they grow interested in eventually becoming full-time employees.

• Contractors encouraged to hire for summer—The Association of General Contractors encourages the hiring of students by its members. They believe it is one of the best ways to interest young men in construction; and at the same time the contractor gets added help. Summer employment can be especially beneficial at the high school level or in the early years of college, before the student has decided upon his professional field, says an AGC representative.

Few contractors go in for organized recruiting, since they have difficulty determining their summer work load in advance. Often a contractor cannot tell until after a pending bid opening how many employees he needs.

Students obtain jobs with contractors largely on their own initiative, by showing up at the job site at the right time. They are apt to be assigned layout work, field inspection, controlling of mixes and similar technician's work.

Utah Construction Co., for example, employs students for the summer on survey crews and as timekeepers and clerks on a completely informal basis. It pays summer hires $300 to $450, depending on the job. For Utah, such employment is deemed profitable for the short-term basis, because students are used only where they are needed.

McCloskey & Co., Philadelphia general contractor, averages 20 summer employees in a 1,000 man payroll. The company gets a chance to observe the engineering students at work, and it then tabs likely prospects for future employment.

Roadbuilding firms that are to cash in on the current highway construction program report that, in general, they will be hiring a sizable summer force.

• More openings needed—Civil engineering students do not seem to lack for summer jobs, but they often find them in fields other than construction.

Most of the requests for civils come from state highway departments, municipalities and aircraft firms, according to college placement bureau reports. Construction companies usually go no further than having their college representatives mention in their routine recruiting activity that some summer jobs will be available.

At this date, several of the larger colleges report that 75% of their engineering students have accepted positions for

the summer months. Those men who already have completed three years of college, and graduating seniors who plan to do graduate work are in greatest demand.

College placement services would welcome more calls from industry. They are eager to cooperate with companies in helping to find the man suited to their particular needs.

High school teachers thus far have been used to a limited extent in engineering and scientific capacities during the vacation period.

However, an industry-education committee in New York City last year found technical jobs for 35 science and math teachers in 17 companies. The organization is composed of representatives of industry, education and the local Board of Trade. Work assigned to teachers included research, development, mathematical analyses, surveys, testing and writing of instructional manuals.

The firms reported that the teachers fitted into the organization smoothly and quickly. Teachers felt that their brief experience in industry, among other things, enabled them to guide their students more effectively toward technical and scientific careers. Both felt that it served to bring industry and education closer together to their mutual advantage.

The committee expects to find positions for more than 50 instructors this year, however, it already has more than 150 applications from teachers and more industry cooperation is desired.

2. *Womanpower for Engineering*

- **Untapped reserve conceded, especially among mothers of grown families**
- **Long-range benefits depend on identifying talented girls early and awakening scientific curiosity**

Education of girls for careers in science and engineering—subject of one of a series of conferences to find cures for the manpower shortage in these fields—was tackled by discussion groups assembled last month at Arden House, Harriman, N. Y., by the School of Engineering, Columbia University.

Financed by a grant from the Hebrew Technical Institute, New York, these conferences have assembled educators from elementary, secondary and college levels as well as representatives of industry and government.

Speakers at this particular conference on recognizing and training talented women included psychologists, anthropologists and educators who are diagnosing the community, family and school attitudes that are diverting boys as well as girls away from science training. Employers of women engineers and scientists gave realistic pros and cons. A women engineer and a civil engineering student outlined their special problems and counterbalancing satisfactions, and girls winning recent awards in the Westinghouse Science Talent Search reported on their elementary and secondary school problems. Government and National Manpower Council representatives outlined the magnitude of the problem.

The discussion groups sparked by these speakers were predominently made up of educators, science and math teachers, guidance counselors and administrators. But also represented were industries that employ scientists and engineers.

Leonard B. Landall of Raytheon Manufacturing Co., which employs 32 women engineers, pointed out that women are the nation's greatest untapped reserve of brainpower since they account for most of the two-thirds of the nation's top brainpower that is not at the present time receiving college training.

• **Five years, then marriage**—The harsh economics of the problem were posed by Prof. Esther McD. Lloyd-Jones, Teachers College, Columbia University, as she defined today's social pattern. The educated girl can be counted on for about five years of work before she enters her "10 year tunnel of love" to set up her family. She is then ready to return to the "labor market" and establish a stable and productive 25 to 30 year career.

That she would need refresher training, or some retraining, was recognized. Professor Lloyd-Jones recommended that our educational system be made inventive enough to set up the facilities to identify such adult talent, and bring out the latent abilities in this great reservoir of women in their thirties and over.

At this time women develop a great burst and flowering of energy and ability, both mental and physical, according to Margaret Mead, distinguished anthropologist now with the American Museum of Natural History. It comes after the last child is launched and it drives husbands and families distracted unless an outlet is found for working off this drive. It comes also at widowhood.

The educators who are planning to set up homogeneous and accelerated science and mathematics courses for gifted children questioned the economics of giving girls equal opportunities to participate with boys in view of this 10 year drop-out in the girls' careers.

• **Working from the home**—But both Psychologist Anne Roe, author of "The Making of a Scientist" and Anthropologist Mead rated home influence high and an educated mother even higher in the influences back of successful scientists and engineers.

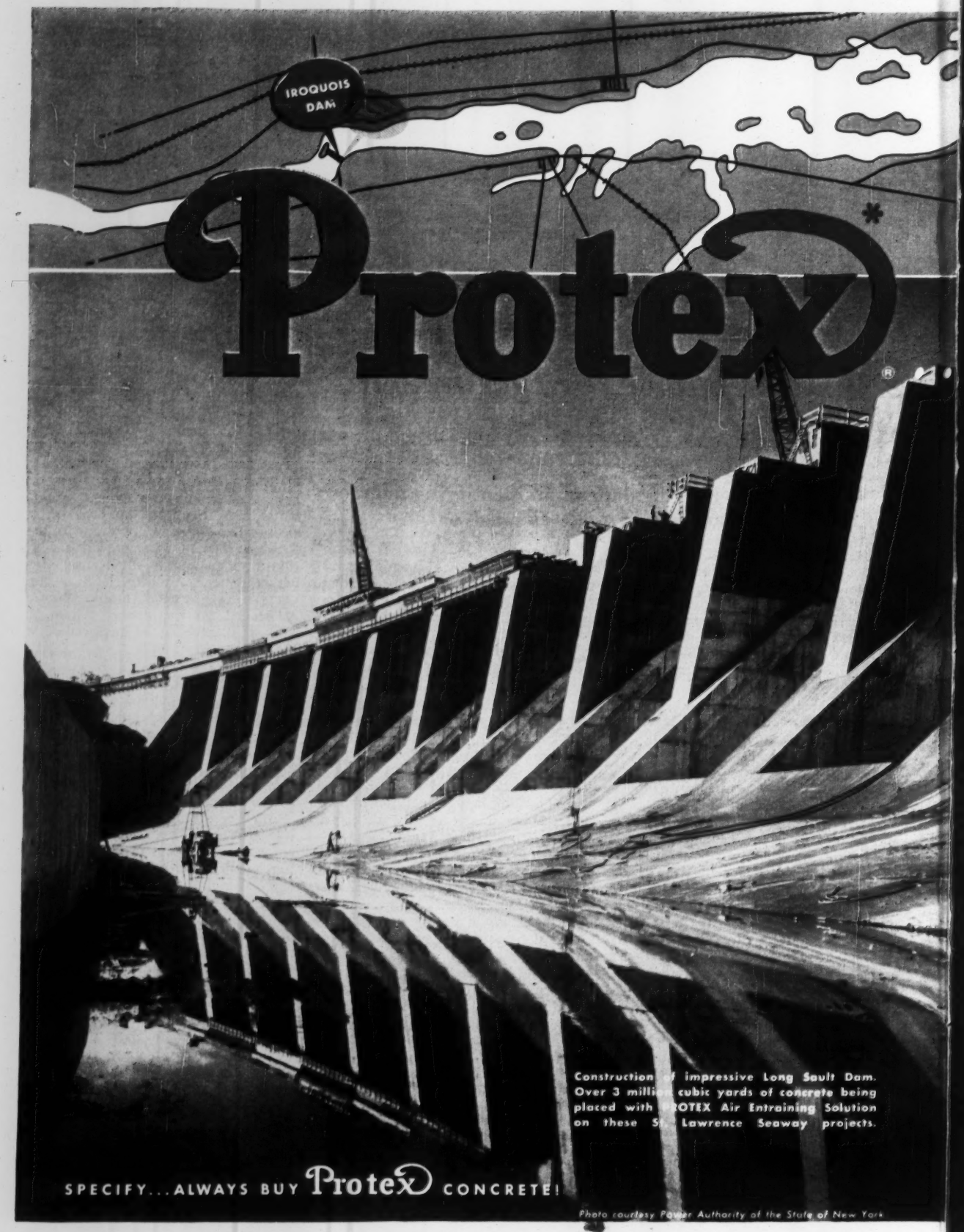
Examples were cited also to illustrate how established women engineers are now actively bridging this 10 year break in their full-time professional work with part-time and free-lance or "consulting" work. This is being carried on from their homes while the babies are small. Individual distaff civil engineers in Pennsylvania and Texas have more "farmed out" design, drafting and computing work of this kind from engineering offices in their areas than they can handle, and an electrical engineer and physicist in New Jersey is working at home on a vibration problem for a small instrument manufacturer. Another electrical engineer is doing special trouble shooting as needed for the factory where she worked ten years as an engineer before she started her family.

• **Encouragement not discouragement**—The conference agreed that teachers and guidance counselors should stop their wide current practice of discouraging girls from studying science and mathematics. It is agreed also that girls should be admitted to accelerated courses according to their abilities.

Another strong point of agreement was that both boys and girls should get the same sound exploratory education in the lower grades so as to arouse and stimulate their curiosity and interest.

Margaret Mead, who is analyzing 50,000 "essays" on how science and engineering are regarded by boys and girls in junior high schools around the country, thinks corrective measures must start in home attitudes and in the primary grades. Engineering fares better than science in these essays.

Researcher Mead warns that sex-typing of occupations is the most expensive thing a society can do. It loses to that occupation not only the brightest members of the other sex but 50% of the top talent. It loses also the balancing and complementing values gained by the differing approaches of the two sexes to the same problems.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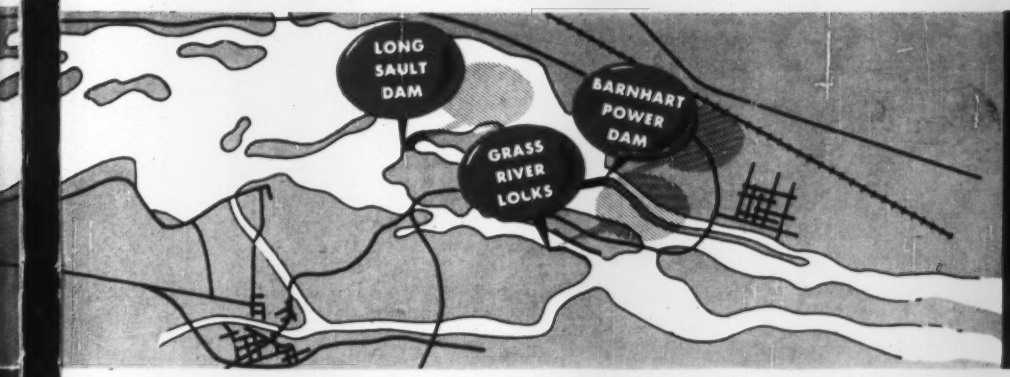

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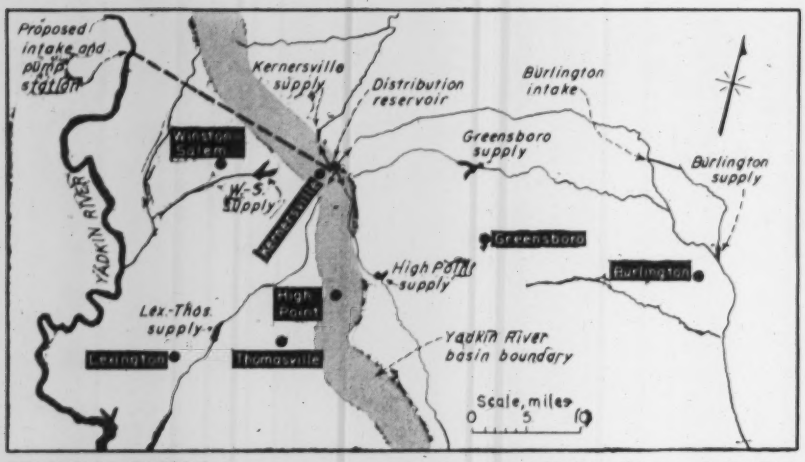

REGIONAL SUPPLY for seven cities would draw from Yadkin River and distribute raw water into the existing reservoirs shown or pipe filtered water directly to cities.

Water Plan Meets Sewage Need

A regional water scheme that hinges on provision of sufficient water both for potable supply and dilution of sewage effluent has been recommended to seven cities in the Piedmont region of North Carolina.

As indicated on the map, each of the cities now has its own surface source on a relatively small nearby stream. One of the major factors that will hasten exhaustion of the existing sources, according to a preliminary engineering report, is a foreseeable need to augment dry-weather flows for sewage dilution. This could well force conversion of some existing raw water storage capacity to such need. For example, Greensboro may have to divert as much as 40% of its storage capacity.

This predicament will tend to develop quickly, because for every additional amount of raw water a stream must supply, it will have to provide still more to dilute the increased sewage resulting.

These pollution requirements, in conjunction with water shortages predicted for the area by 1965 due to normal growth, resulted in the recommendation of a supplemental central water supply drawing from the Yadkin River, major tributary of the Peedee River which empties into the Atlantic Ocean 50 miles above Charleston, S. C.

Two plans are feasible: a raw water scheme as shown, or a treated water plan that would necessitate a filter plant adjacent to the Yadkin and finished water lines leading from the distribution reservoir at Kernersville.

Pumpage from the Yadkin under the raw water plan would be about half that necessary with the filtered water scheme. For with adequate individual filter capacities assumed under the raw water plan, the municipalities would utilize wet-weather flows in their present sources, and pumping from the Yadkin would be required only during drought periods. But if a filtered supply were obtained from the Yadkin, local filter plants would not be enlarged and the entire deficiency would be met from the Yadkin.

• **Planning figures**—Average water consumption in the seven cities is estimated at 39 mgd in 1956, 70 mgd by 1970 and 160 mgd by 2000. Peak daily requirements only 35% greater were employed, due to the leveling effect of relatively large industrial use. Raw water deficiency, based on average consumption, is expected to reach 15 mgd by 1980 and 80 mgd by 2000. But treated water deficiency, based on peak daily requirements, may reach 27 mgd by 1970, 57 mgd by 1980 and 150 mgd by 2000. Safe yield of existing sources is 54 mgd; present treatment capacity is 70 mgd.

The proposed raw water plan would provide 50 mgd capacity at a cost of $10 million. In the early stages, cost of water furnished to Burlington, Lexington and Thomasville would not warrant their participation in such a project. For a modified four city project, raw water costs including distribution to existing sources would range from $145 to $210 per mg for a 10 mgd draft down to $35 to $50 per mg for a 50 mgd pumpage. The range is due mainly to differences in length of transmission main to sources of participating cities.

The filtered water plan, in its first stage, would provide a 30 mgd supply at a cost of $23 million, including distribution mains. Capacity could be expanded to 50 mgd for only $3.5 million, however. Water costs under a four city project would range from $286 to $411 per mg for a 10 mgd draft, down to $105 to $132 per mg for a 50 mgd use, the range again mainly due to varying distribution line lengths.

Yadkin River flow at the proposed intake point averages 1,320 mgd. Minimum discharge is 152 mgd.

• **Recommend filters**—The consultants recommend the filtered water plan. Additional cost of the filtered water system would be balanced out to a large degree by the cities not having to expand pumping, transmission and filter facilities to handle Yadkin River raw water. Further, filtered water could be delivered directly into the participants' distribution systems, thus providing a second completely independent finished water supply. Finally, filtered water from the Yadkin would be available to rural users from transmission mains running between the cities.

The Yadkin River project report was prepared for the Seven Cities Water Committee, representing the municipalities, by the engineering firms of Piatt & Davis of Durham, N. C.; William C. Olsen & Associates of Raleigh, N. C., and Hazen & Sawyer of New York City. Should they decide to proceed, the cities would form an authority.

Kentucky Picks Advisors To Aid Highway Officials

Taking a somewhat unusual step in highway administration—and in line with campaign promises—Kentucky's Gov. Albert Chandler has appointed a 39 member "citizens committee" to confer with and advise highway officials on location and priorities for building roads in the federal-state highway program.

Appointed to head the committee is John F. Williams, Ashland industrialist, who headed a similar group appointed in 1953 by former Gov. Lawrence W. Wetherby.

The committee is to meet as soon as possible to organize itself so that road-building projects prepared during the winter can be cleared for action as soon as practical.

In naming the committee, the governor fulfilled a promise he made during the November election campaign last year, at which Kentuckians voted more than 6 to 1 in favor of a $100 million bond issue to provide funds to match federal-aid highway allotments. During the campaign, questions were raised as to what projects the state would use the money for if the bond issue was authorized. Governor Chandler guaranteed that he would follow recommendations submitted by the Automotive Safety Foundation, which completed a 2½ year survey of the state's needs in 1955.

The Safety Foundation recommendations also included plans for reorgani-

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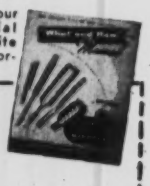

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zation of the Highway Department—a move that has already been accomplished—and Governor Chandler also promised to appoint a watchdog committee to see to it that proper priorities were maintained.

Road Probe Goes On

Political strategy forms in Pennsylvania inquests

Action continued last week in the many-sided investigations of the Pennsylvania Highway Department and the Pennsylvania Turnpike Commission as political leaders jockeyed for position.

Principal political development included a decision by Republicans who control the Pennsylvania legislature, who agreed to scrap a proposed $100,000 probe of the now Democratic-controlled Highway Department. A bill passed by the House, calling for a probe and a report to the 1959 legislature, will be sidetracked in the Senate under the new strategy move. Also slated to die in the Senate is a Republican introduced bill that would rip out the present Highway Department and replace it with a three-man commission with staggered six year terms, to assure continuity in management regardless of political change.

In another political development, Democratic Gov. George M. Leader announced the appointment of a 15 member highway study commission under the State Planning Board to prepare a long-term capital budget for road construction and to study highway construction in all its ramifications.

Meanwhile, the Pennsylvania Supreme Court cleared the way for the start of trials of 23 persons linked with the Pennsylvania Turnpike's "scandal," when the court refused to hear appeals asking that some of the indictments be quashed. While the high court was making this decision, a special grand jury probing the road commission recommended 23 more indictments.

On still another front, two more employees of the Turnpike Commission —the purchasing agent and the superintendent of the pike's auto fleet—were suspended from their jobs pending the outcome of a presentment by the special grand jury, which recommended indictment on charges of criminal conspiracy.

Railroad Link Surveyed To New Wyoming Ore Bed

A nine man crew is now at work surveying a route for an 82 mile railroad line that would serve a new iron ore mine near Atlantic City, Wyo. The mine, of low-grade deposits, is owned by Columbia-Geneva Steel Co. and the firm is now in the process of deciding whether it will proceed with development of the deposits.

The crew, representing the Union Pacific Railroad and Morrison-Knudsen Construction Co., is surveying a route from near Winto Junction to the mine site. One major problem will be a crossing of Willow Creek, near South Pass City. The canyon at this point is deep and narrow and whether a bridge or a fill will be used is a question to be decided.

What Is EJC?

Engineers Joint Council describes its functions

Engineers Joint Council has printed and distributed 250,000 copies of a leaflet titled "The Voice of the Engineer", in which it attempts to state simply what EJC is, what it does and how it does it. Publication of the leaflet is born of EJC's realization that even within its constituent societies there are many engineers without full realization of its organization, purposes and effectiveness as the "Voice of the Engineer."

The council is called "A federation of professional societies whose memberships total a quarter of a million engineers . . . dedicated to the betterment of the nation and to the professional and sociological development of the individual engineer . . . Engineers Joint Council represents the engineers' broad profession, and works for engineering by promoting sound public recognition of the engineer."

Further, the text of this leaflet, which will be given broad circulation among constituent societies, points out that the nation's engineers can through EJC bring their constructive thoughts to bear on national manpower policy, employment conditions for engineers, science and engineering education, national resources policies, labor management relations and nuclear energy applications.

Created in 1945, the organization now represents 15 engineering societies and is governed by a board of directors appointed from governing bodies of the constituent groups. Annually it holds a general assembly, and its Nuclear Congress held in 1955 and again early this year has developed into an impressive conference of all kinds of engineers on this matter of common concern.

Engineers Joint Council works in close cooperation with Engineers Council for Professional Development. So close is this cooperation, in fact, that there is now an effort to combine the organizations and the effectiveness of the two.

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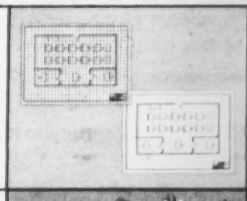

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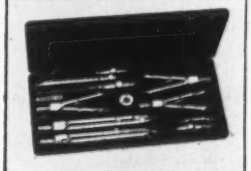

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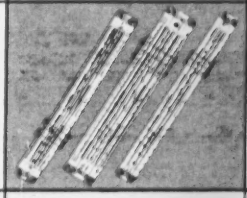

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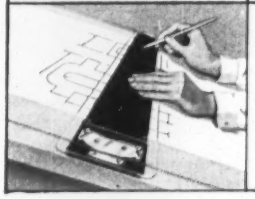

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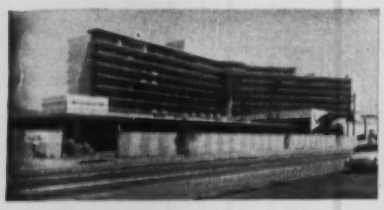
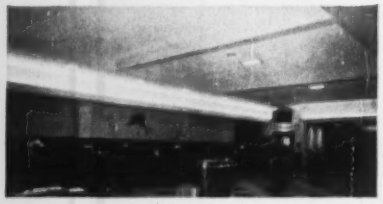


BEVERLY HILTON HOTEL, Beverly Hills, Calif.—Plaster-Weld sprayed on concrete ceilings of $14,000,000 new construction prior to finish plastering. ARCHT: Welton Becket F.A.I.A. & Assoc.; GEN'L CONTR: Del E. Webb Construction Co.; PLSTG. CONTR: Carroll Duncan & Co.



MARINE BANK, Tampa, Fla.—Plaster-Weld applied directly to oil painted ceilings prior to a finish coat of acoustical plaster. ARCHT: Eliot C. Fletcher; GEN'L CONTR: C. A. Fielland, Inc.; PLSTG. CONTR: Joe W. Robertson.

Wooden Pipe Uncovered

During "Plant a Tree Week" in Los Angeles, tree planters on Olvero St. uncovered pine timber pipe—probably buried earlier than 1868 to convey water in the privately operated municipal waterworks of the day.

Found 4 ft deep, the 32 in. wooden pipe lengths are 4½ in. square and have a 3 in. bore augered through them. A crude cast-iron joint held these lengths together, and tar coated them.

Holding the evidence of L.A.'s 19th Century advancements are Richard E. Hemborg, engineer in charge of water distribution at the Los Angeles Department of Water and Power, and Miss Jo Ann Moyle, also of the department.

Public Relations Program Will Explain Highway Jams

The California Division of Highways has started an intensive public relations program aimed at preparing motorists for what the state expects to be one of the worst traffic snarls in history.

The tie-up, the state cautions, will be caused by construction work on a 5 mile stretch of Highway 40, between Floriston (east of Donner Pass) and the Nevada border.

To ease irritation and to explain what is being done, huge signs will be posted on the highway at either end of the job, far enough ahead of the work so that motorists can detour if they wish. The signs will advise the traveler of the possibility of a long wait. However, should the motorist decide to go ahead on the main road, he is likely to be greeted by one of several public relations men assigned to explain the delay.

The problem, state engineers say, is that the narrow ledge that now supports the highway must be widened by blasting the towering cliffs that rise above the roadway. The narrow area provides little working space except the existing roadway.

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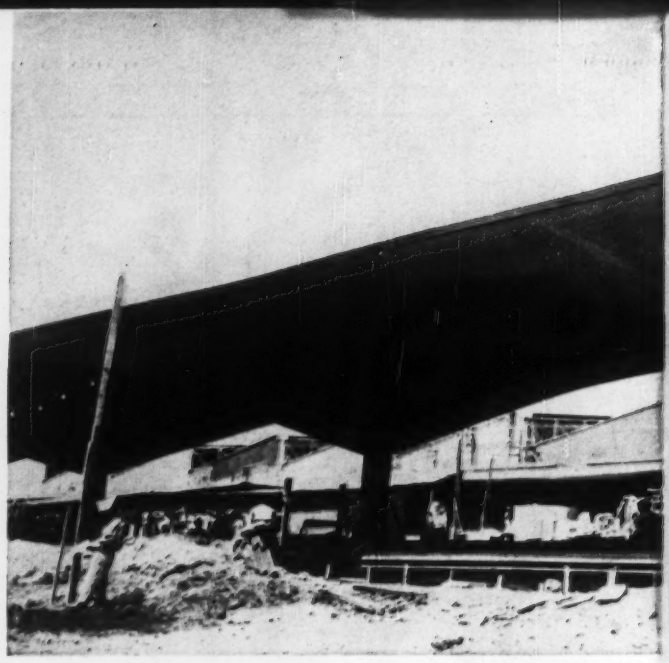
Buildings with hyperbolic-paraboloid roofs vie with skyscrapers in a city's startling transformation



ROOFS SUCH AS THIS, appearing on factories, markets, warehouses and churches, are indicative of a new architecture that is putting . . .

Umbrellas Over Mexico City's New

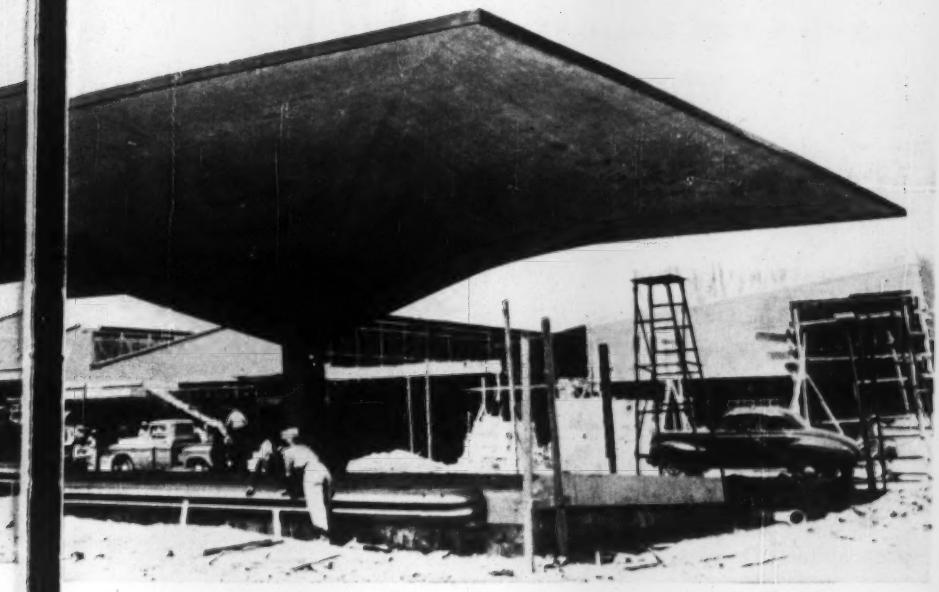
Waldo G. Bowman
Editor, Engineering News-Record

For the past decade Mexicans have been working feverishly to modernize their capital city until today no visitor can be unaware that something important is going on. Indeed it would seem that one of the prime objectives has been to startle the visitor by unusual building forms and facades. The diverse, colorful structures of the new University City are a case in point. Another is the growing line of narrow, louvred window skyscrapers along the Paseo de Reforma, the city's main thoroughfare. And a third, and most recent, manifestation is the blossoming of thin concrete umbrella (hyperbolic paraboloid) roofs on large acreages of industrial buildings, public markets and even on two churches.

It is this roof development that is presently most significant because of the remarkable economy being claimed for the simpler forms and of the experience being gained with the more complex shapes. That the roofs are the product of a single individual—Felix Candela, an architect-engineer-builder, whose reputation has been growing in the United States and abroad—is further cause to regard them with special interest.

• **Farther afield**—There is, of course, much more afoot in Mexico City than is readily apparent to the casual visitor. And even farther afield, in the provinces and some of the other cities, notable construction is under way. Vera Cruz and Acapulco, for example, have shown some of the same tendencies toward growth and modernization as has Mexico City. In Vera Cruz the emphasis has been on port and industrial construction plus the 400,000 kw Tecuanteplec hydro project, not far away, which should be turning out power next year. Acapulco's building, on the other hand, centers on hotels, the existing Caleta undergoing a doub-

TALL BUILDINGS, TOO, change the skyline. Narrow skyscrapers are popular because they permit day light to penetrate to all the interior. Here (left), they line Mexico City's Paseo de Reforma, while (above) is the framework for a hotel in Acapulco.



Buildings

ling in size, while the concrete frameworks of two new hotels are ready for enclosure, although one of these, the Acapulco Hilton, is now without any plans for completion.

In the tropical southeast, too, the great Papaloapan Valley development has made considerable progress in river channel rectification for flood control and navigation and in dam construction for irrigation and power storage. Other irrigation system dams and structures are under way in the arid north. And, concurrently with this resource development, has gone a stepped up program of roadbuilding until all major cities are connected with reasonably modern highways, and some with ultra modern divided expressways.

In all of this work, the objective has been to achieve a maximum increase in agriculture consistent with the water available; to develop industries that fit into the habits and products of the people, and to provide for both agriculture and industry a transportation system over which their output can be moved efficiently.

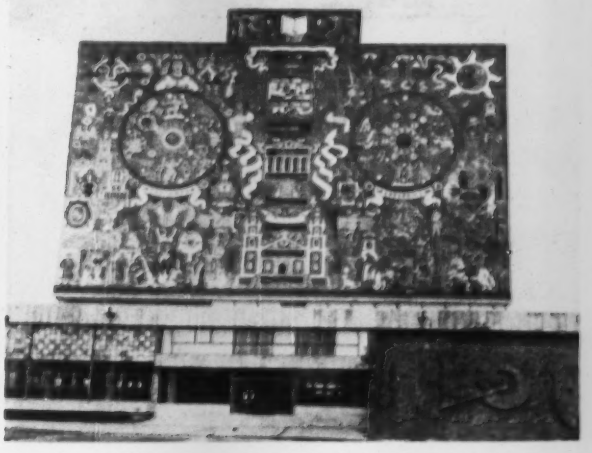
• **A growing capital**—All of this work outside of Mexico City, however, adds up to not much more than normal development. It by no means spells a boom, while what has been going on in Mexico City is just that. The accompanying table (page 42), showing the number of new private buildings registered annually, might seem to indicate that the peak of the boom was passed in 1954, yet another set of government statistics places 1955 and 1956 private construction on a par at about $31 million each.

Other than the desire for modernization and better living facilities, the Mexico City boom is also propelled by a population growth which has brought the metropolitan area total to nearly 4 million, according to latest estimates. This has put a strain on transportation facilities, on water supply and on power. Streets are being widened, meters are being installed on the water distribution system to cut waste, and the 150,000 kw hydro power station at Tingabato, 120 miles south of the city, is being rushed to completion.

Most of the new office buildings of recent years have been built along the Paseo de Reforma, with some also along an intersecting main thoroughfare, Avenue Insurgentes. An unusually large current building project involves a group of tall steel structures to house a governmental medical clinic, but in general there are many fewer uncompleted buildings in evidence than was the case five years ago—a possible sign that the private building boom is tapering off since it has heretofore been the practice to start a building regardless of whether sufficient funds were in sight to finish it.

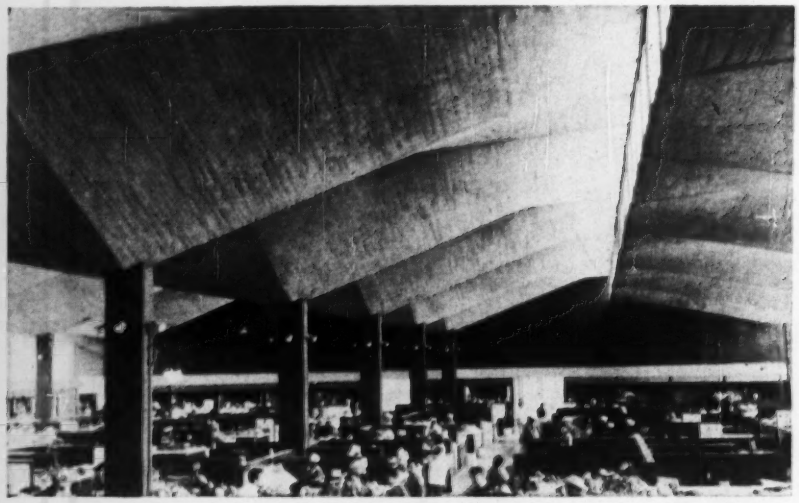
Most of the skyscrapers which have been built tend to be long and narrow. Sometimes this is a result of the shape of the site available, more often it results from a desire to keep office space near windows and thus eliminate too much dependence on artificial light. Natural light, however, is frequently too bright, so that the facades of most of these buildings feature sunshades, some horizontal, some vertical.

Each of the buildings seems to suggest a conscious effort to be different or daring, with most observers agreeing



MODERNISTIC BUILDINGS of the National University set a fast architectural pace even in Mexico City where modernism is the rule. At left, the medical school group, above, the library whose walls are covered with murals in natural colored stones.

. . . Architect for Mexico City's umbrellas—Felix Candela



PICTURESQUE STREET MARKET (above) give way to orderly stalls (right) under an umbrella type hyperbolic paraboloid roof arranged to provide light through monitor windows for the new Coyoacan Market.

that the overall effect is good and properly expressive of modern skyscraper architecture. More divided opinion can be obtained with respect to the forms and facades of the buildings on the new campus of the National University of Mexico in the suburbs of the city, but even an architectural critic would have to pay tribute to the versatility and courage with which the designers used color, natural stone mosaics and diversity in building types to achieve spectacular effects. The only plain and conventional building in the group, strangely enough, houses the School of Architecture.

• **Architect of thin shells**—The most interesting current development, however, in Mexico City is the hyperbolic paraboloid r of, and extensive, new industrial developments on the outskirts of the city have afforded a good opportunity for its use. A new city ordinance abolishing the open street markets (with which the city abounds) in favor of stalls in covered buildings has also created a field for this umbrella type roof. The reason why it flourishes, however, results in the activities and ability of a Spanish-born architect-engineer named Felix Candela, who introduced it and has built a specialized practice in designing and constructing it.

Mr. Candela's firm is called Cubiertas Ala, which means winged roofs. He usually refers to his product as umbrellas, however, and he has recently been putting industrial Mexico under umbrellas at the rate of over 25,000 sq ft a week. In the past seven years more than 200 separate projects have been completed.

At first it was the esthetic appeal that attracted clients to the thin, curved concrete roofs, but it was soon evident that the greatest advantage was in the economy. In Mr. Candela's opinion no other type of building covering can be provided as cheaply as an umbrella roof. It is being built for 75 cents a sq ft, while adding walls and utilities to make a complete building brings the total cost up to only $1.50 per sq ft.

Construction is also reasonably rapid since traveling forms are used, and a 33 x 66 ft roof unit, for example, can be completed in a week. And design is now on a standardized mass production basis. In fact, Mr. Candela finds so little professional satisfaction left in the design of simple umbrellas that a good deal of his time is now spent in promoting and designing more complicated forms. He admits, however, to a continued interest in the simple umbrella because it provides the bread and butter income to permit further study and experimentation in the thin shell field.

Mr. Candela's associates characterize him as a daring architect, an imaginative engineer, a brilliant mathematician and a thoroughly alert on-the-job supervisor. It seems fairly certain that he

FELIX CANDELA whose remarkably engineered hyperbolic paraboloid roofs in thin shell concrete dominate Mexico City's latest wave of architectural expression.

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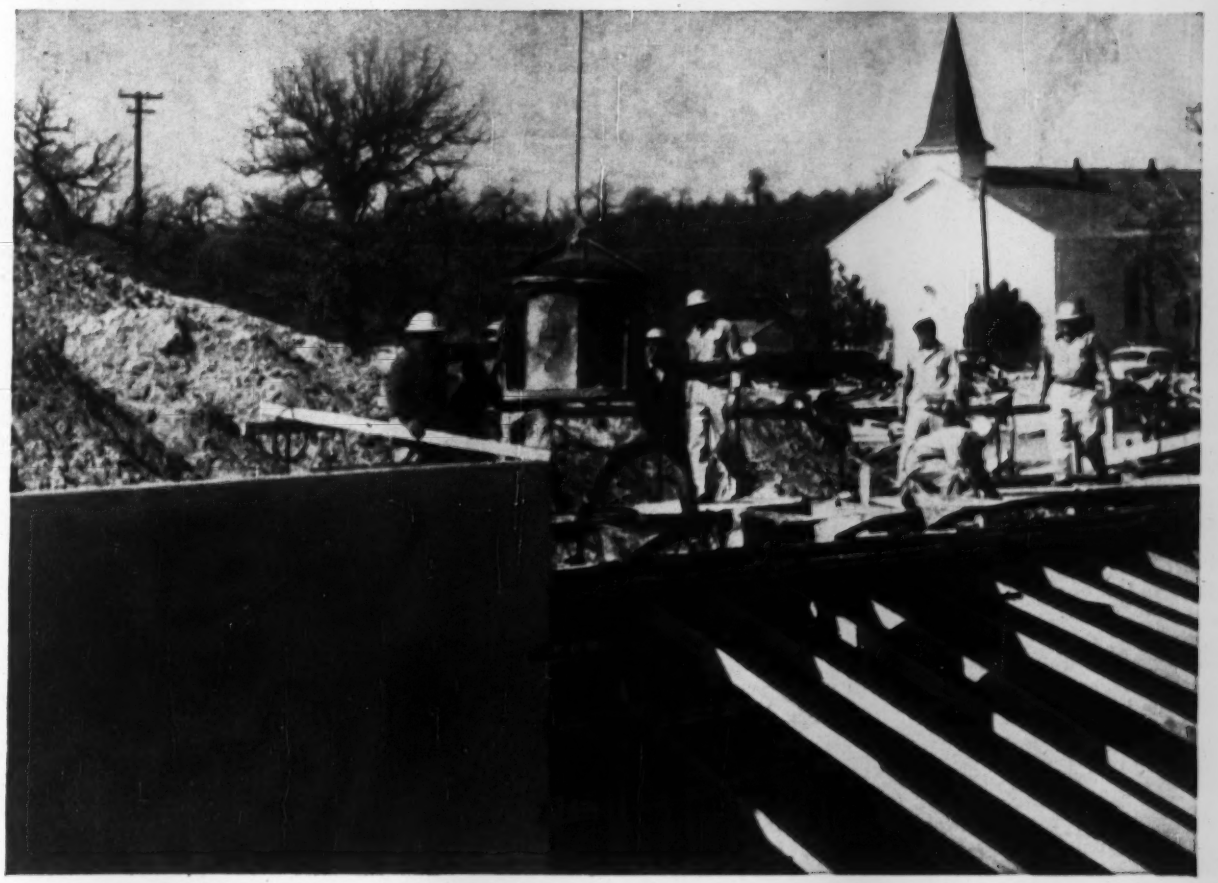

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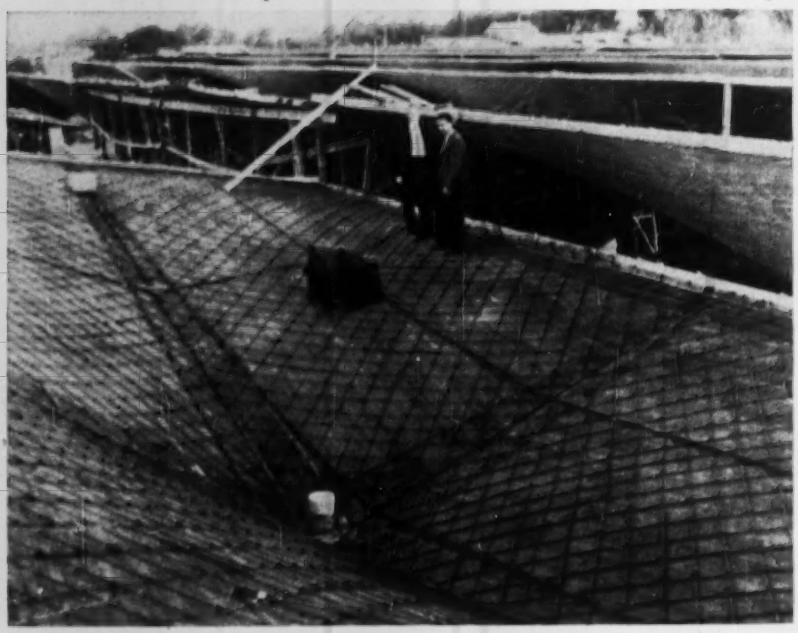
. . . Umbrellas—top and bottom—for Mexico's industry



AN UMBRELLA A WEEK is the rate of progress on this factory being built in a new industrial area on the outskirts of Mexico City.

has fathomed the intracacies of stress distribution in curved concrete shells so completely that he has no peers in the understanding of their actions under loads.

He, himself, is quick to point out, of course, that he did not originate the theory of hyperbolic paraboloid design. He traces its beginnings to French engineers, whose ideas came to his attention about 1930, just as he was about to enter architectural school in Madrid, where he helped pay his way by serving as an assistant instructor in mathematics and descriptive geometry.

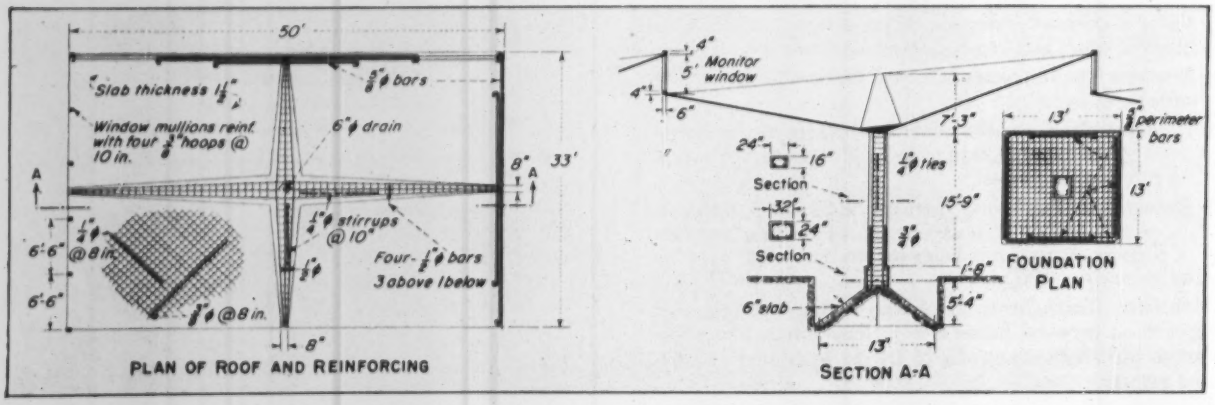
He graduated in 1935, and his reputation as a mathematician brought him immediate jobs with a number of Madrid architects. He might still be there had it not been for the Spanish civil war but, escaping to a hastily improvised refugee camp in France, he was given the task of supervising the construction of dormitories for his camp mates. As he puts it, "This was my introduction to town planning." Shortly thereafter he was one of a lucky few to be chosen by the Society of Friends for removal to Mexico. Two years later he became a citizen of that country.

For the first ten years after his arrival, necessity forced him to work on the fringes of architecture, as either a contractor or a general consultant. But by 1949 he had accumulated enough savings to open his own firm with his brother. Now 47 years old, his reputation is firmly established in Mexico, and he has been called to lecture at such U. S. universities as M.I.T., Columbia and Harvard. He is also consultant for Associated Architects and Planners of Dallas, who are beginning the construction of the first large installation of umbrella roofs in the United States for a new industrial park in that city (ENR Oct. 4, 1956).

• **Umbrellas for factories**—The greatest area of Candela hyperbolic paraboloid roofs covers factories and warehouses—many of them in the new Vallejo industrial district north of town, where the city has decreed its freight handling facilities are to be concentrated to eliminate trackage within the city and the street traffic delays caused by train movements. These roofs, with extremely low stresses, are composed of units or bays, generally rectangular, in dimensions of 33 x 50 ft (although some of 80 ft have been built), and with each unit supported by a single column at its center and structurally independent of other units.

The surface of each roof unit is not a complete saddle-shaped hyperbolic paraboloid, but rather four warped rectangles butted together along their inclined edges, with the column support at the lowest point. They are thus dish-shaped and, since the four edges of a unit lie in the same horizontal plane, other similar units can readily be joined to it to cover any area desired. The thickness of the roof shells is 1½ in. throughout except in the groins where an added thickness is needed to resist the compression.

An interesting aspect of most Candela factories and warehouses around Mexico City is the foundation design, which is also an umbrella, but an inverted one. Actually each foundation is a pyramid-like footing, consisting solely of a thin concrete slab placed di-



HOW REINFORCING STEEL IS ARRANGED in a typical umbrella roof. Only the quadrants are outlined in heavy bars, the rest of the 1½ in. thick concrete surface being strengthened with grid of lighter bars.

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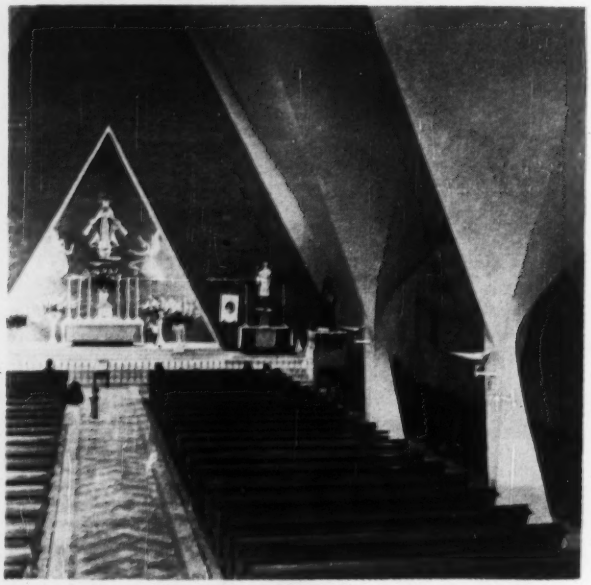
. . . Thin-shell concrete covers both the market places and churches

WITH CURVED THIN SHELL CONCRETE SURFACES Architect-Engineer Candela provided the Iglesia de la Virgen Miligrosa with a striking exterior and a roomy interior.



GRACEFULLY SOARING COLUMNS, supporting the thin shell concrete roof of the Iglesia de la Virgen Miligrosa, strike a new note in church architecture.

rectly on the ground, which has been excavated in the shape of an upstanding pyramid. The column supporting the roof is set on the apex of the pyramid. After the foundation slab is placed, the excavation is backfilled. Given the type of soil prevalent in the area, this kind of a footing adequately distributes the load, and the concrete used is a mere membrane compared to the relatively thick slab that would be required for a conventional flat footing.

• **For markets too**—Umbrella roof installations have also been used to cover several of the public markets, which the city is building under a program which saw 23 new markets started during 1955 and 1956 at a cost of $4.6 million and 30 additional ones begun this year to cost $11.6 million. The objective is to replace all native street markets which, while colorful to visitors, are unsanitary and inefficient.

Although the market building roofs are typical umbrellas, one point of departure, however, is the incorporation of monitor type windows as shown in the accompanying view of the Coyocan market on which Pedro Ramirez Vasquez was the architect and Mr. Candela the designer and builder of the roof. These windows are easily provided merely by tilting all the umbrellas uniformly in the same direction, providing in this way long horizontal openings between each bay; vertical sash is installed along the openings.

• **More complicated forms**—One of the intriguing and vastly useful characteristics of the hyperbolic paraboloid shape is that, in whole or in part, it lends itself to various combinations and arrangements. Mr. Candela has taken advantage of this fact in two churches, with unusual results.

The Iglesia de la Virgen Miligrosa, now completed, is shown in two of the accompanying illustrations. Covering a ground area of 16,500 sq ft, it is an intricate combination of hyperbolic paraboloid shells, none over 1½ in. thick. One of its most striking characteristics is the slender, willowy shape of the interior columns, from each of which a series of umbrella petals rises. The form of these columns parallels very closely the actual diagram of the forces involved, which partly explains why they have been made so slender.

The second church, San Antonio de las Huertas, will consist of a series of three groined vaults, one of which is shown in an accompanying illustration. Designed by Mr. Candela for the architect, Enrique de la Mora y Palomar, each vault is formed by two intersecting saddle shaped hyperbolic paraboloids. A small space will be left between adjacent vaults and covered with glass, so that light can filter down from an

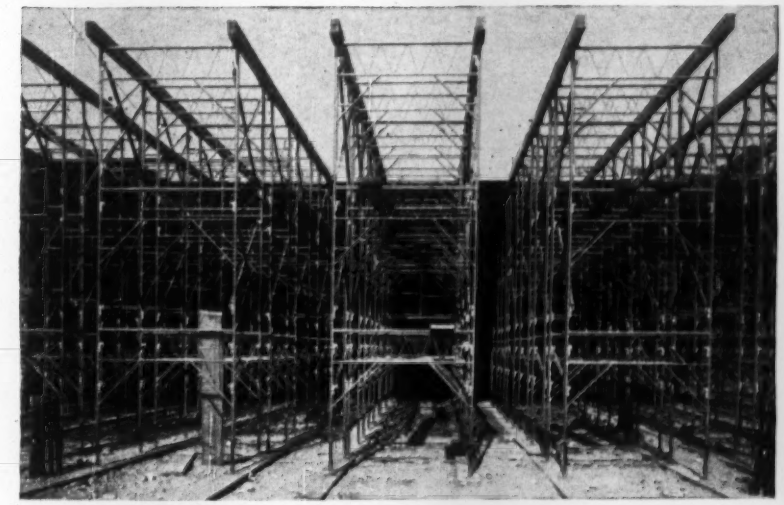
Private Construction in Mexico City

(Registration of New Buildings—1950-1956)

	1950	1951	1952	1953	1954	1955	1956
Number of buildings by type							
Total	6,194	6,571	7,073	6,292	24,730	12,175	6,597
Single family residence	5,054	5,361	5,911	5,025	22,135	10,303	5,295
Apartment buildings	826	922	876	913	1,915	1,400	950
Commercial and office buildings	195	165	190	200	346	339	261
Industrial buildings	69	75	63	72	204	84	60
Other buildings	50	48	33	82	130	49	31
Area constructed (1,000 sq meters)	1,540	1,845	1,886	1,992	3,120	2,086	1,740

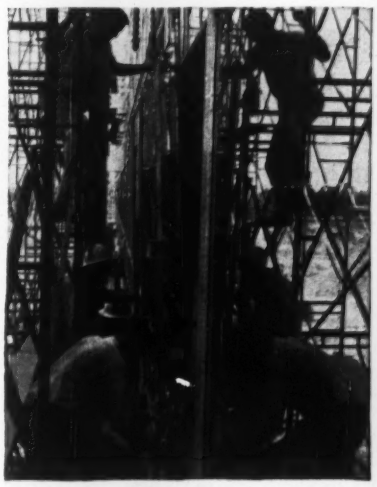
Source: Departamento del D. F., Direccion de Gobernacion, Seccion Estadistica.

Scaffolding Methods . . . by Patent Scaffolding Co.

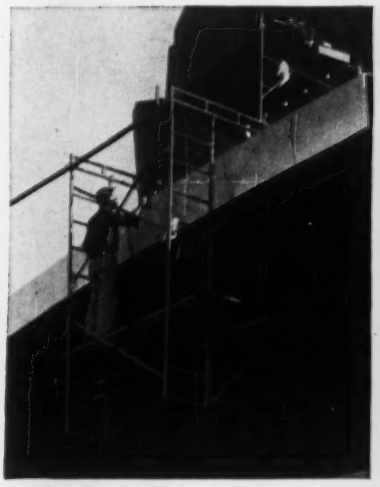


PREFAB SHORING FOR 12" SLAB—On a new 150' x 350', two-story building for Polaroid Corp., Waltham, Mass., general contractor Aberthaw Const. Co. needed support for a 12" slab. 4000 "Trouble Saver"® Shoring frames assembled in rows 3' and 3'6" apart easily provided for it. Job supt., Al Parsons, Jr.. says "We found these shoring frames, braces and components very easy to handle. We know that this type of shoring goes up faster, cuts costs and gives us maximum access to the base slab for other work".

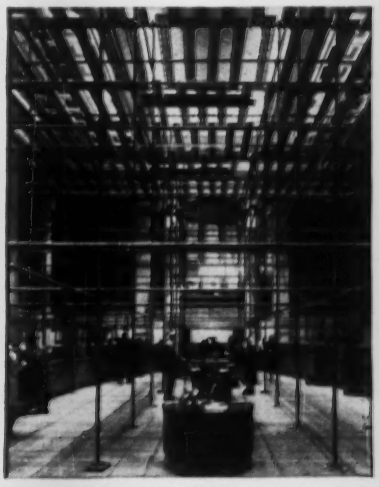
DOUBLE-DUTY—Both the wheeling ramp and the mason's platform in back are made from prefab sections of "Trouble Saver Scaffolding. Varying-height frames and adjustable legs achieve the slope. Terminal Construction Co., Woodridge, N. J., general contractor.



GLASS SETTING RIG—A special rig, developed by Pittsburgh Plate Glass Co., with 700 "Trouble Saver" Scaffolding frames for working platforms, places 8' x 11' glass panes for Conn. Gen. Life Ins. Co. new building, Hartford. Eight rubber cups grip panes, overhead crane lifts to position. Turner Construction Co., general contractor.



ROLLING SCAFFOLD—Unusual set-up is made of two 5'-wide, counter-weighed "Trouble Saver" Scaffolding frames on casters. 12'-trusses are attached and ladder frames hang below. Sidewall brackets make two-level platforms. Scaffold rolls around roof perimeter of new Dallas Memorial Auditorium. R. P. Farnsworth & Co., gen. contr.



BANKING AS USUAL—Smoke damage due to fire made a wash and paint job necessary at the Marshall and Isley Bank, Milwaukee. Painting contractor, Carl L. Ruhland, used "TubeLox"® Scaffolding with Featherweight Stages to provide working platforms for ceiling and high wall work above and to permit banking traffic as usual below.

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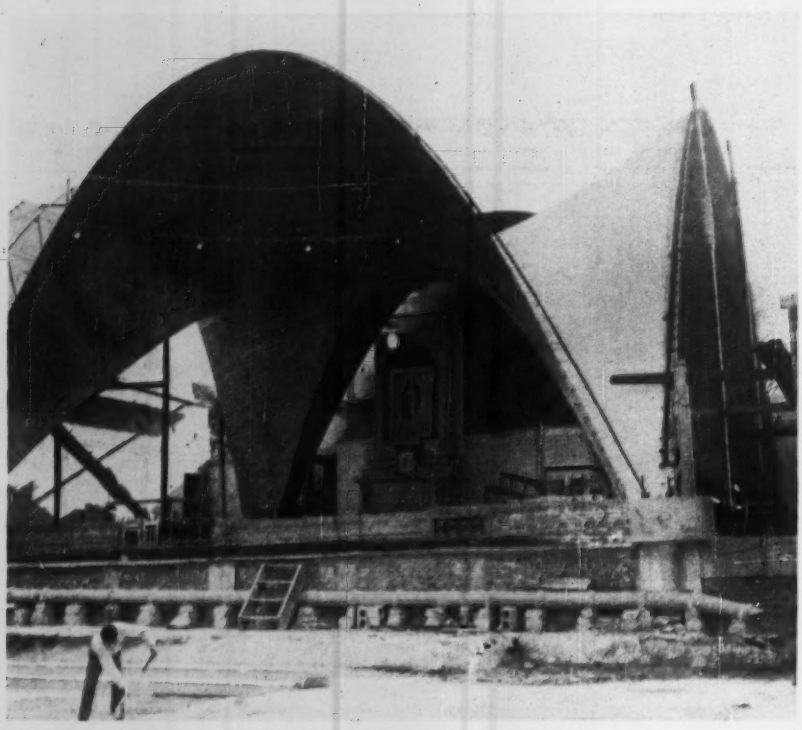
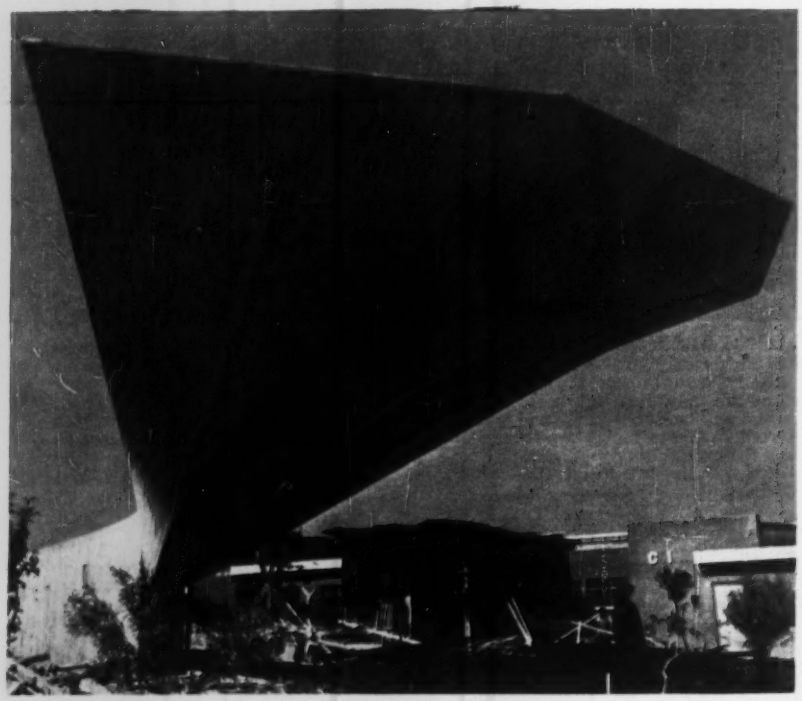
. . . New uses of hyperbolic paraboloid coming



INTERSECTING HYPERBOLIC PARABOLOIDS give a groined arch effect to the church of San Antonio de las Huertas. The Candela plan includes three of these elements in line to cover the whole church.



SIX PARABOLOID PETALS cantilever 40 ft to provide a spectacular bandstand roof in a large workers' housing project now under construction.

unseen source. Before the middle vault is built, a basement will be excavated in this portion, and it also will be roofed with small-rise hyperbolic paraboloids on top of which the floor of the church will be supported. The main roof vault will then be built to cover this floor.

This church, San Antonio de las Huertas, is continuing to hold services while its old building is being replaced, a third at a time.

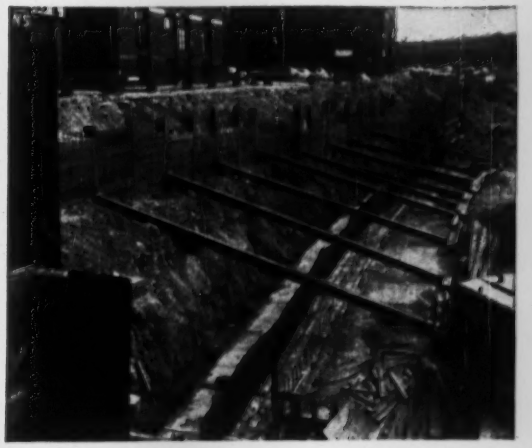
The two churches have heightened Mr. Candela's interest in more complicated forms of shell construction. For example, in place of the four petal element of the simple umbrella, he used eight petals in the roof units pictured in the headpiece of this article. In these 60 x 60 ft units the diagonal arches springing from the center to each corner enabled the rise of the paraboloids to be kept relatively low. He is now working on a roof unit which will have undulating edges formed by 12 petals or segments rising from a single column.

Another special shell, which Mr. Candela developed for a bandstand covering in a workers' housing project at the suggestion of the architect, Mario Pani, is shown in one of the acompanying illustrations. Although seemingly complicated, this structure was completely designed in a single day. It consists of six hyperbolic paraboloids springing from a single point of support. Each paraboloid starts at the base as a vertical and ends at the edge as a horizontal. The length of the cantilever is 40 ft.

The latest Candela development involves the design and construction techniques for a hanging hyperbolic paraboloid roof which will be in tension instead of compression. This suspension type roof with doubly curved surface will require no formwork to build, and as presently planned will stretch over an area of 135 x 155 ft. It will be used to cover an auditorium-gymnasium for a normal school.

Although Mr. Candela is usually called an architect, his clients are most often other architects, so that he sees his function as that of a structural engineer, and also a contractor since his firm builds the roofs that he designs. But whether as an architect, engineer or builder, Mr. Candela finds Mexico City an exciting place to practice. It is growing rapidly. Its building code is not restrictive for capable designers. And its people are happy to see anything tried which can be referred to as the "first" or the "biggest." Under the circumstances, a man with Mr. Candela's abilities and imagination could not be better located. The architectural and engineering profession the world over has already benefited.

Bethlehem H-piles provide lateral support for excavation for railroad tunnel under construction at Salem, Mass. *Contractor:* Farina Brothers Co., Inc.



Construction of Boston's Fitzgerald Expressway included placing of Bethlehem H-piles as soldier beams. *Contractor:* V. Barletta Co.

Soldier beams and bracing support foundation of existing buildings adjacent to new Jordan Marsh Building, under construction in Boston. *Contractor:* Spencer, White, and Prentis, Inc.

Steel H-Piles Used as Soldier Beams on Three Jobs in Massachusetts

For three important construction projects in Massachusetts, Bethlehem H-piles were used as soldier beams in open-cut excavations.

The first job is a portion of the construction of Boston's new Fitzgerald Expressway, a heart-of-the-city superhighway. Here H-piles were driven vertically on the sides of a large open cut during the building of a tunnel and ramps. The piling and its lateral bracing will prevent slides and protect existing foundations and adjacent streets.

Bethlehem H-piles were used in the same way in the construction of the new Jordan Marsh Building in Boston. Here adjacent building foundations were protected by the H-piles together with horizontal timber lagging and lateral braces.

At Salem, Mass., an open cut for a railroad tunnel was also protected by the soldier-beam method. Bethlehem H-piles retained foundations of streets on which traffic continued to move.

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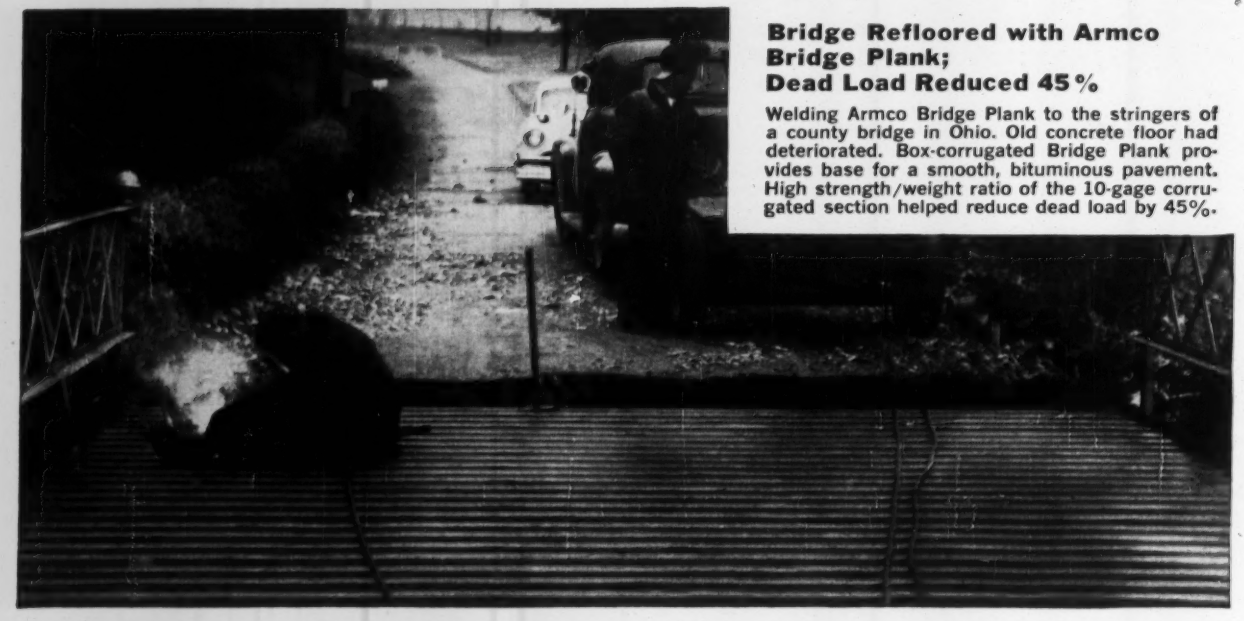

Bridge Refloored with Armco Bridge Plank; Dead Load Reduced 45%

Welding Armco Bridge Plank to the stringers of a county bridge in Ohio. Old concrete floor had deteriorated. Box-corrugated Bridge Plank provides base for a smooth, bituminous pavement. High strength/weight ratio of the 10-gage corrugated section helped reduce dead load by 45%.

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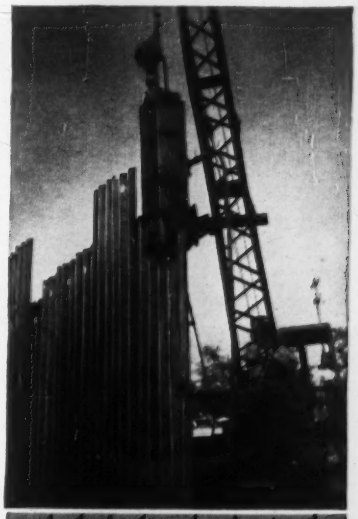

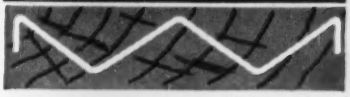

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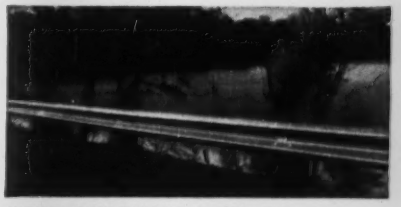

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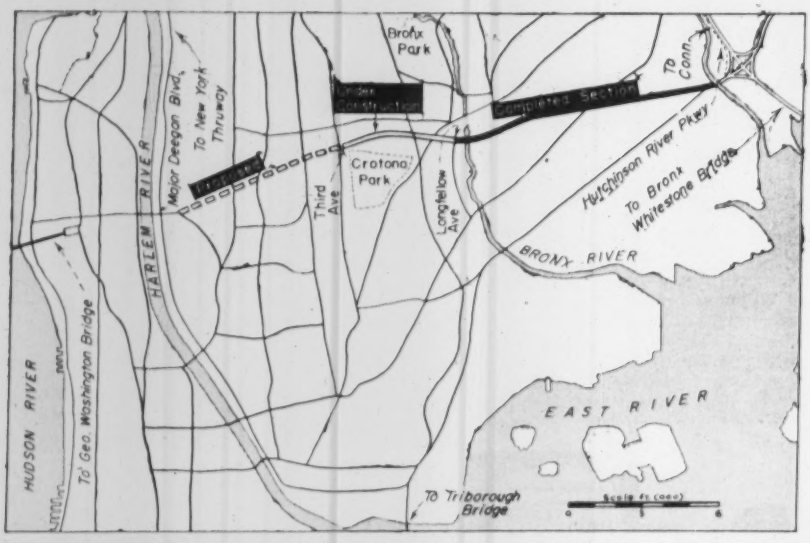
Eight-Tenths

CUTTING THROUGH an area solidly packed with apartment houses and served by a maze of underground ufilities is a slow, tough expensive part of adding another link to New York's highway network.



CROSS BRONX EXPRESSWAY will link the north-south highways and the George Washington Bridge approach with the north-south highways on the east side of the city.

With the completion of more than half the difficult rock excavation, another section of the Cross Bronx Expressway—less than one mile in length but costing the State of New York and the Federal Government $9.5 million—will soon be added to New York City's complex road network.

The expressway will eventually link north-south highways and the George Washington Bridge approach on the Hudson River (west) edge of the city with the north-south highways such as the Hutchinson River Parkway and the Bronx River Parkway on the eastern side. By way of the Hutchinson River Parkway the link will be continuous to the Bronx-Whitestone Bridge for access to Long Island or to Connecticut and the New England States.

The section under construction picks up the completed end of the Cross Bronx Expressway at Longfellow Avenue and pushes west about 12 city blocks to Third Avenue—a distance of 0.8 mile—cutting through an area packed wall-to-wall with apartment houses and served by a maze of underground utilities such as water mains, sewers, gas lines, telephone cables and electrical conduits, plus two elevated rapid-transit lines. These obstacles had to be moved or relocated, many of the buildings torn down, but work done without disrupting the community. To make matters more complicated the subsurface section for the road right-of-way is more than 80% rock.

• **Long planned**—The Cross Bronx Expressway was to be a major construction program after World War II, planned to supply work for returning veterans and to coincide with the expected shut down of industries engaged in war material production.

Work was started in 1946. But no shortage of jobs developed—rather, it was a shortage in housing, that held up the work.

To acquire the right-of-way it was first necessary to evacuate thousands of people living in the lower middle-class area. In the years following the ending of hostilities, relatively lowcost housing was not readily available. The tenants of the area could not all be moved into the few new apartment houses being constructed in the Bronx and the New York Area, at that time.

The highway project had to wait. In order to ease the delay the expressway route was cut into a number of small sections, so that it was possible to move out the residents living in the right-of-way area in small groups and in a more efficient and orderly manner. The

Mile of City Expressway for $9.5 Million

COMPLETED SECTION runs onto construction operations at Longfellow Avenue from which point the Cross Bronx Expressway pushes westward for about 12 blocks to Third Avenue—a distance of 0.8 miles.

families were relocated as the work approached each section, as construction crews started on the east end and progressed slowly toward the west.

The section presently under construction, which was started in August 1956, extends from Longfellow Avenue to Third Avenue. The road length is approximately 0.8 mile and runs south of and parallel to Tremont Avenue. As designed, the section is all depressed so that all local streets must be carried over the top of the expressway on six structures.

• **Major excavation**—General contractor, under a $9.5 million contract is the Conduit and Foundation Corp of Philadelphia, Pa. Sub-contractor doing the rock excavation work, for $1.6 million, is the Yonkers Contracting Company, Inc., Yonkers, New York.

The excavator is removing 3,000 cu yd of unclassified material—as much as 80% of it rock—per day. Ten-wheel dump trucks and rock body trucks haul the excavated material eastward on another completed section of the road to the New England Thruway site near Pelham Bay section of the Bronx, approximately five miles from the cut. About 220,000 cu yd of material is earmarked to go to this site, while the remainder of the estimated 600,000 yd is to be hauled three and one-half miles to the site of a future state hospital off Westchester Avenue on the Hutchinson River Parkway. To date about 65% of the general excavation is done, all under the supervision of Yonkers' General Foreman Silverio Mazzella.

Four 2½ yd shovels, two truck cranes, 18 wagon drills and nine 600 cu ft compressors as well as a 900 cu ft compressor are being used to work the cut. To haul out the excavated stone are 35 ten-wheel trucks, each with an average load capacity of 10 cu yd, and five rock body trucks, each capable of carrying an average load of 13 cu yd. All this is supported by a force of about 140 men. In the line-up of heavy equipment are also included two heavy dozer-equipped crawlers.

• **Touchy blasting**—The areas under the right of way are practically solid rock. Upon clearing the overburden and debris from the demolished buildings, the contractor started his rock excavation with the use of explosives.

The stone seemed to be fairly soft at the Third Avenue end but in other excavations, tests indicated an increasingly hard stone to very hard as the job moved eastward from Third Avenue.

Four cutting operations are being worked simultaneously, with a blaster at each location, backed by a complete crew working under his supervision.

The contractor is doing his blasting in layers because the rock cuts to be made are deep—the average cut being 30 ft, the maximum depth being 40 ft. The width of the cut was about 90 ft.

Because the area was heavily populated and thickly congested with traffic, Project Manager Salvatore Soraci said that he has stepped down his excavation in lifts of 15 to 20 ft for safety reasons, and to reduce the vibration and shock. At extra hazardous locations, such as under the rapid transit's elevated structure on Boston Road, the

. . . At times line drilling was the only solution

BLASTING and hauling is a major operation as 10 wheel dump trucks load up for a five mile haul. Some 600,000 cu yd of general excavation will be done before completion.

30 ft cut will be made in three lifts.

New York Fire Department regulations control the maximum blast in the various areas. The number of holes are determined at each individual site by proximity to the existing buildings adjacent to the job site, by the depth of the cut to be made and the amount of utilities in the immediate area.

In one day about 2,000 lb of powder is used, consisting of 40% gellatin. With millisecond electric blasting caps (ENR March 31, 1955 p. 49), it is possible to increase the amount of explosives without increasing vibration, shock or noise, and to offer the blaster a means of controlling the throw. Blasting one section of a bench first and exposing a new free face to each succeeding blast seems to direct the throw toward the holes previously detonated. However, safety mats are being used along with all the other necessary precautions to be taken when making use of explosives in a congested city area. For the general safety of the public the New York area is covered by some very stringent controls that affect construction methods.

A typical set of millisecond delay blasting caps comprises 17 electric caps having different built in delay periods. The caps are numbered in the series, with the higher numbered caps having progressively longer delays. The No. 0 cap is instantaneous. The No. 16 cap has a delay of 550 milliseconds. The number of caps in this series allows practically infinite pattern variations.

The caps fire individually but in such small time relation to each other that the action of certain charges supplements the action of other charges before there has been any appreciable movement of the burden or release of gases from behind the burden. Throw of the fragments may be directed away from houses and buildings by shooting that portion of the cut away from the built-up area first, and then detonating the other holes in such a manner as to direct the throw toward the holes fired earlier.

In some cases where the sections in which the rock excavation was very close to the existing buildings, blasting could not be done with safe results, especially if the depth of the subsequent rock face was to be large.

Special measures had to be taken to prevent damage to adjacent buildings and footings of existing structures. It was therefore necessary to line drill along the affected areas thus minimizing the danger of overbreakage. Wagon drills, and jackhammers cut numerous parallel vertical holes about four to six inches apart on the line to which the rock was to be removed. The procedure was slow.

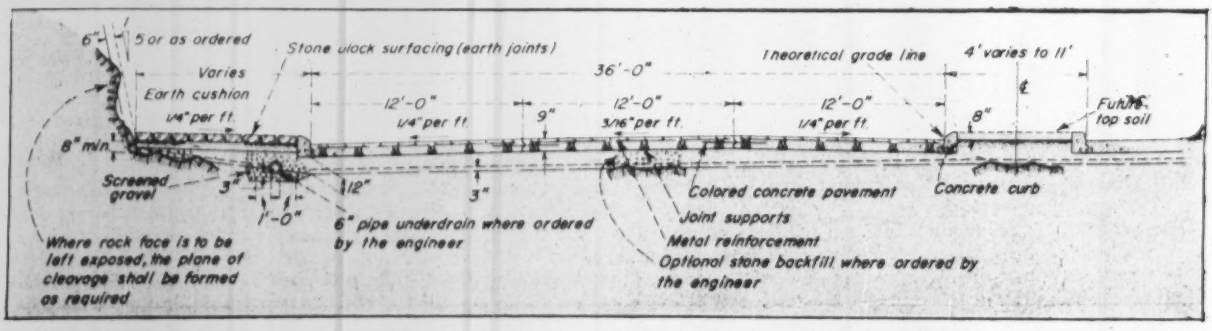
• **Road pavement**—The unclassified excavation in rock was made to the subgrade line as shown on the plans, with a tolerance of three inches allowed.

The roadway cross-sections indicate cuts of as much as 90 ft across. They include three east-bound and three west-bound lanes divided by a safety island from four to 11 ft wide. The roadbed will be cleaned of loose stone, then a back-fill of granular material will be placed upon the road bed as required. The fine grade is then trimmed and nine inches of concrete will be placed for the road pavement, including reinforcement and joint supports.

The concrete will be tinted with lampblack for the express lanes with a natural concrete used for the deceleration lanes. The curbs will also be cast in place in reinforced concrete. Service walks along side the expressway will be surfaced with stone blocks embedded in an earth cushion.

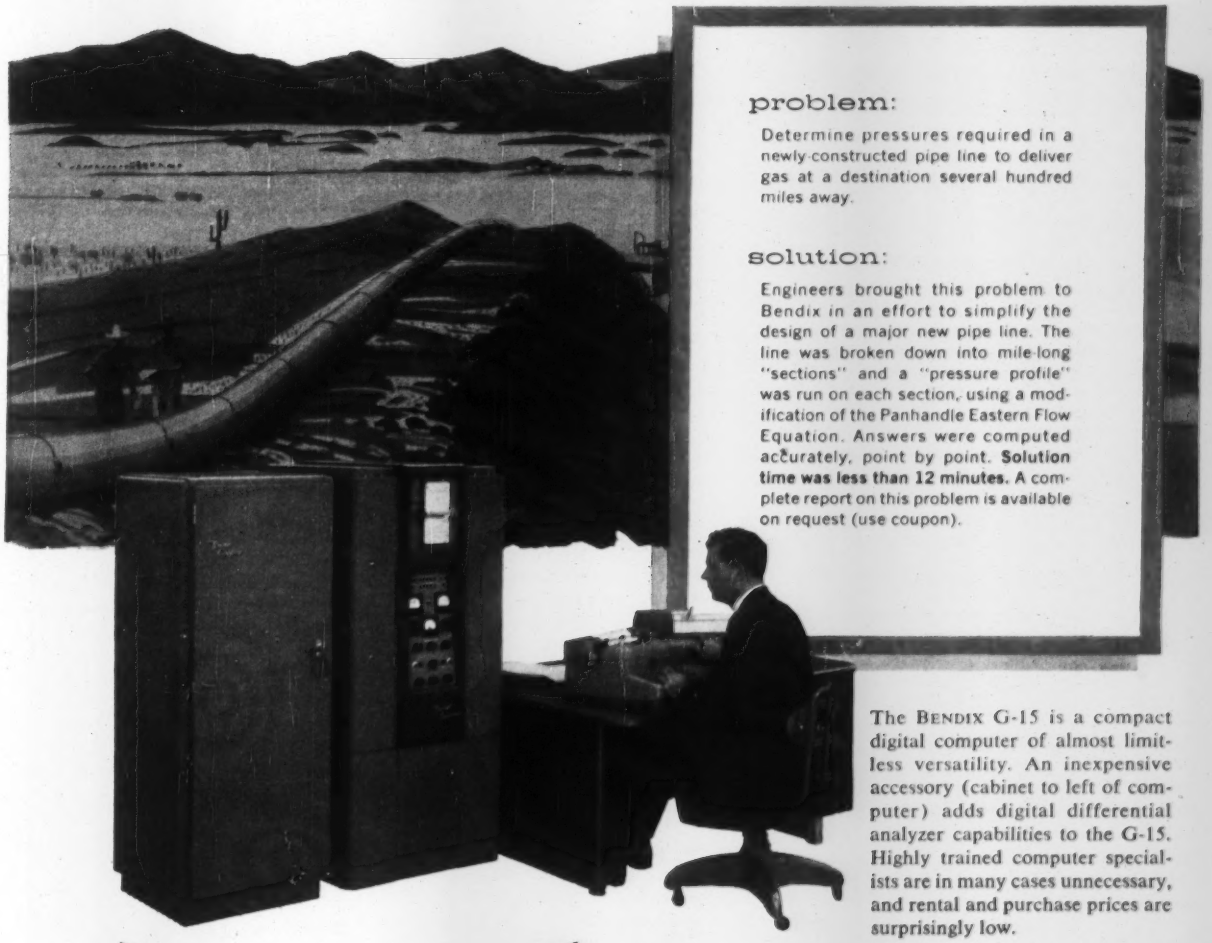
Access roads will vary from 14 ft. to 24 ft. in width and will also get a nine inch concrete pavement with similar steel reinforcement as will be used for the express roadway.

The service roads on the other hand will get a three inch sheet asphalt pavement on top of a six inch concrete base which in turn rests on the road bed. The curbing here will have a steel facing



A CROSS-SECTION indicates tricky problem of placing pavement almost directly on the rock sub-base.

a *Bendix Computer* simplifies cross-country pipe line construction



problem:

Determine pressures required in a newly-constructed pipe line to deliver gas at a destination several hundred miles away.

solution:

Engineers brought this problem to Bendix in an effort to simplify the design of a major new pipe line. The line was broken down into mile-long "sections" and a "pressure profile" was run on each section, using a modification of the Panhandle Eastern Flow Equation. Answers were computed accurately, point by point. **Solution time was less than 12 minutes.** A complete report on this problem is available on request (use coupon).

The BENDIX G-15 is a compact digital computer of almost limitless versatility. An inexpensive accessory (cabinet to left of computer) adds digital differential analyzer capabilities to the G-15. Highly trained computer specialists are in many cases unnecessary, and rental and purchase prices are surprisingly low.

Bendix Computer

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Please send me more details on Model G-15 General Purpose Digital Computers, and include a copy of the pipe line report.

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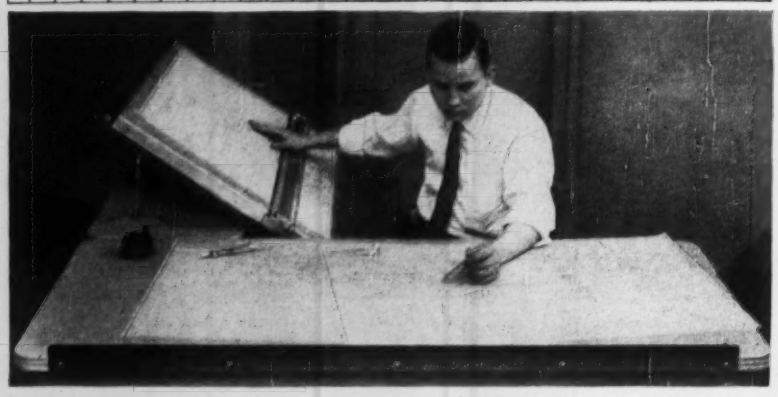
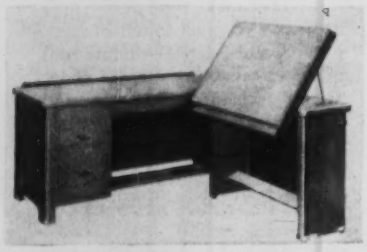


"L" angle table cuts fatigue, speeds drafting

The year 1956 saw the introduction of a drafting table destined to change the working habits of many draftsmen. Made by the Hamilton Manufacturing Company and distributed by POST, it is the result of years of experimentation into methods of decreasing drafting fatigue and increasing productivity.

Designed as an "L" this new unit has a complete reference area at a right angle to the drawing board (see photo). Unlike many table arrangements in which the draftsman must turn around completely, or leave his board altogether, the new table *consolidates* the entire working area—the reference desk is never more than a slight turn from the board. This arrangement conserves a surprising amount of time and motion.



Reference desk is 28" x 60" and contains 3 drawers. Board is available in sizes 26" x 40" and 36" x 48".

Like Hamilton's *Auto-Shift* table, the new "L" table adjusts easily and quickly. A hand trip permits slope adjustments to any angle from vertical to horizontal. Another release frees the board for height adjustment through a range of 8". These convenient adjustments are easy to operate and step up efficiency. Where semi-privacy and other unique advantages are needed, the "L" angle table's versatility is especially desirable.

Another motion-saver: "Boardmaster" drafting machine

While very helpful on the board, many drafting machines have characteristics which almost nullify their value—blind spots, awkwardly placed controls, slippage in control settings, etc.

The Universal "Boardmaster" drafting machine solves many of these problems. Its overarm construction allows complete visibility of the protractor at all times. The controls are all *centrally located*—conveniently placed for manipulation by two fingers.

The indexing control has a push-button action that provides automatic indexing every 15°. The vernier clamp has an ingenious double wing lever for locking intermediate angle settings.

Aside from operating ease, the "Boardmaster" meets the highest standards for accuracy. No other drafting machine can match its precision and easy operation.

Further information on these items is available from the Reader Service Division of Frederick Post Company, 3658 N. Avondale Avenue, Chicago 18.

POST

SENSITIZED PAPERS & CLOTHS • TRACING & DRAWING MEDIUMS • DRAWING INSTRUMENTS & SLIDE RULES
ENGINEERING EQUIPMENT & DRAFTING SUPPLIES • FIELD EQUIPMENT & DRAFTING FURNITURE

. . . under pinning problems

made up of bulb angles and attached anchors.

• **Structures**—The structures carrying the local streets over the expressway are each of a different design so that no two bridges look alike. There is a cellular type concrete rigid frame bridge with an 89 ft span at Arthur Avenue and a 110 ft span concrete arch type at Crotona Avenue. Rigid frame concrete bridges will supply the crossing at Marmion Avenue and at Southern Boulevard, each bridge having two 49½ ft spans. A steel girder structure containing two 58 ft spans will bridge Boston Road.

One structure will be a 485 ft tunnel which will be built by cut and cover. The top of this will be developed as a playground for small children of the kindergarten class. For the older children, a softball diamond, basketball courts and handball courts will be built. The areas running parallel to the expressway and the odd bits of lots, will be utilized as sitting areas with benches and shade trees planted. These will be City park areas, but most of the playground will be immediately over the tunnel.

• **Underpinning**—There will be some underpinning problems on this project. The footings for the structure to be erected at Crotona Avenue happen to fall under the foundations of an apartment house located on the southeast corner. The foundations and the building above it will have to be underpinned and supported as the structure footings are constructed underneath.

The Interborough Rapid Transit Division's White Plains Line elevated structure at Boston Road will similarly require underpinning. Here it is a matter of transfering loads. Seven columns supporting the structure on the street will have to be underpinned as an approximately 30 ft cutting operation is carried through the Boston Road intersection. The structure loads will be temporarily carried on shafts through grillages to a level below the excavation grade. After the cut is completed the supports will be removed as the loads are transferred to the beams of the steel girder which will span the expressway at this point to carry Boston Road.

Lloyd P. Crumb is the resident engineer on this section, representing Andrews, Clark & Buckley-Hardesty & Hanover.

Pushing toward completion of the needed artery, state officials recently let contracts for demolition of more of the structures that stand in the path of the last link of the expressway—between the end of the present job and the Harlem River to the west.

How to widen streets fast

This No. 977 Traxcavator* digs concrete, asphalt and compacted earth, loads a truck every 2 minutes, grades as it goes

Vogel Construction Corp. was widening 1.6 miles of 38th Street, Indianapolis, Ind., when this picture was taken. The job included excavating 40,000 cu. yd. of old concrete, digging up front yards and driveways. Street width was increased from 40 to 80 feet. And most of the work was done by a CAT* No. 977 Traxcavator.

Hard earth, broken concrete and asphalt are tough materials to dig, but the machine's superior pry-out action resulted in full bucket loads. The main problem was keeping enough trucks under the bucket. The No. 977 was loading a truck in less than 2 minutes, and it maintained a good level grade as it dug. Vogel Construction Corp. also found the No. 977 good at skimming asphalt off of old pavement.

Caterpillar-built Traxcavators have been designed for one purpose—to increase your production and cut costs. The No. 977, largest of the line, gives you the power and performance for big road jobs. Its 100 HP engine and ample track surface back up the 2¼ cu. yd. bucket with tremendous digging force. Quick-acting hydraulic controls add to the machine's great maneuverability. It's easy to operate and has maximum job visibility.

Balanced weight distribution makes for good stability on rough terrain or steep grades. The 40-degree tilt-back of the bucket at ground level prevents spillage. And the bucket can be raised almost 12 feet for high load clearance.

Get the full story of this rugged, modern excavating tool from your Caterpillar Dealer. He'll demonstrate the No. 977's performance on your own job, and he stands behind its long, profitable work life with dependable service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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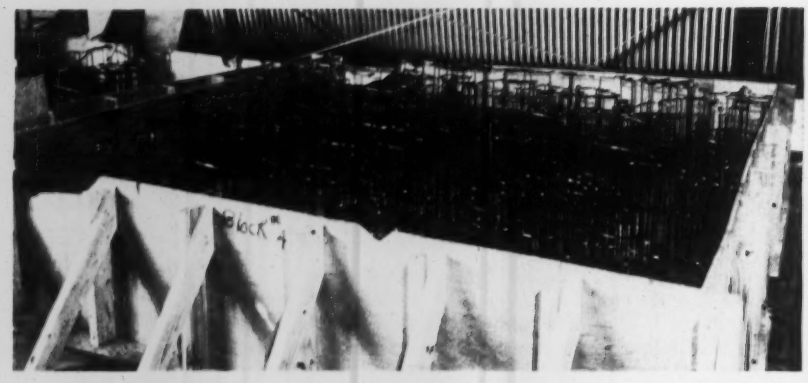
BUILT FOR THE HARD WORK

Rivers Turned Out on Assembly

Unskilled labor and quick casual checks for accuracy replace highly skilled help and detailed engineering supervision in building a gigantic river model

Strap iron is bent to contour lines . . .



. . . then brazed to elevation rods . . .

. . . and concreted to form river model sections

The step specialization methods of mass production are finding an unusual application—the building of a 220 acre scale model of the Mississippi River and its principal tributaries at the Corps of Engineers' Waterways Experiment Station Suboffice in Jackson, Miss., a branch of the famed Vicksburg center.

This unusual adaptation of a factory technique is an accomplishment in simplicity—where relatively unskilled labor forms complex sections of river, which are then hauled to the model site and joined to those already in place. As on an assembly line, the task is broken down into simple steps assigned to different workers on the line. A section under construction goes together in the following manner:

- Contour maps of the section are enlarged by photographic projection to the full size of the model. These are placed in the bottom of a large, shallow wooden box that is the form for the section.
- Workers bend ¼ in. wide strap iron to correspond to each contour line on the map.
- Vertical rods whose heights correspond to the contour elevations of the map are set upright in the form, giving the exact elevations shown on the map.
- The iron-strap contour markers are then brazed to the appropriate elevation rods. The result is a three-dimensional set of templates to guide later workers in placing the concrete contours of the model.
- One-half inch reinforcing bars are now woven into the form for strength. Screw jacks, to be used in mounting the section at the site, are set in place for enclosure in concrete. A concrete-saving sand blanket, its thickness and modeling determined by the contour features, is then placed in the bottom of the form.
- Thus readied, the section goes to the concreting crew. With contours exactly marked, manual skill only is required and accuracy of reproduction is almost automatic. After being cured, the section is transported to the model site by truck and lifted by crane for mounting.
- The sections are set on concrete piling sunk 10 ft through surface stratum to firmer ground. Built-in jacks enable the section to be leveled accurately. Finally, joints between section are sealed with neoprene.

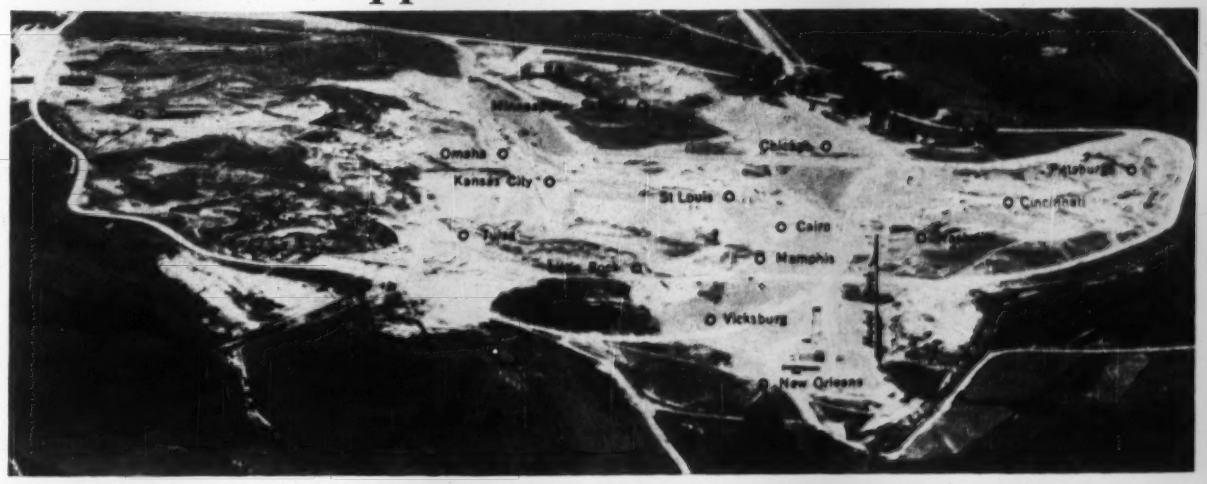
And as one section is being placed, there are other sections moving on rollers from stage to stage until they too are ready to be fitted to the growing model of the Mississippi Basin.

Line Basis

Two of the advantages gained by precasting the sections—instead of casting them in place on the ground as was first done—are savings in engineering manpower and labor costs. The earlier method required detailed supervision by engineers and the employment of laborers who possessed almost an engineer's qualifications in doing the work—no longer necessary.

The use of piles as a bed for the model avoids a problem encountered with initial portions of the model—particularly the Missouri River—when cast in place on the ground. The Jackson Clay surface of the site swelled when wet and caused heaving of the model, with distortions of as much as .8 in. This resulted in deflections that threatened the accuracy of the model, forcing tedious remedial measures to be undertaken.

. . . The Mississippi Basin Model



PREPARING THE SITE for the 220 acre working model of the basin meant reshuffling over 1 million cu yd of terrain to approximate the 1.25 million sq mile watershed of the Upper Mississippi River.

The gigantic working model taking form at Jackson, Miss., will eventually reproduce the entire basin of the Mississippi River. In 220 acres will be portrayed the 1.25 million sq mi watershed of the Mississippi—a project initiated in 1942 by the then Chief of Engineers, Maj. Gen. Eugene Reybold.

The primary purpose of the model is its use in studies of bulk movement of flood waves. It will facilitate development of plans for coordinated operation of all flood-control works in the Mississippi Basin—works that include approximately 200 reservoirs, several thousands miles of levees and many other control structures.

Flood tracking and routing, a principal task for the model, was dramatically employed during the record Missouri River flood of 1952. Model tests, set up on data received from points along the flood's path, produced predictions that were used to guide flood-fighting activities along the entire reach of the Missouri.

The discharge scale, model to prototype, is 1 to 1,500,000. The model is designed so that different sections can be operated independently and simultaneously for different tests—or it can work as a synchronized unit.

To operate the completed model as a unit will require 1,000 gpm; with several parts simultaneously, but independently, water requirements can run to 8,500 gpm. A recirculating water supply system will supply one-half of this volume.

CONFLUENCE of the Missouri and Mississippi rivers is one of the completed portions of the Mississippi model. Automatic instruments record and control the state of the river. The metal cubes are positioned on a trial and error basis until the model flow corresponds to that of the actual stream. Airplane steel landing mats are also being tried on some models to reproduce streambed characteristics.

An outstanding feature of the model is its instrumentation. It was estimated that a staff of 1,500 would have been needed for total manual operation. Instead, fully automatic instruments and centrally located control houses provide a system of remote control. And operation of all instruments is synchronized by a master timer which also registers the proper month, day and year as they occur in the model to the proper time scale.

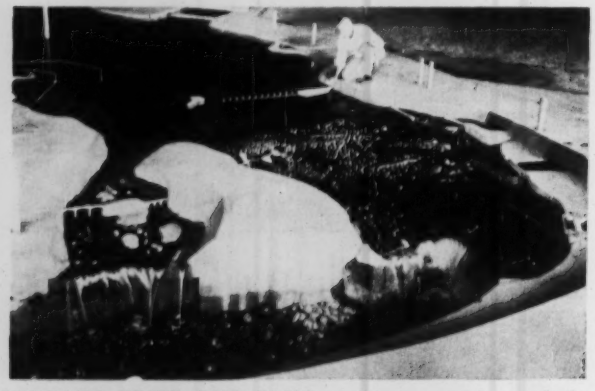
Portions of the model now completed and in operation include the Missouri River from Sioux City, Iowa, to the mouth; the Mississippi River from Hannibal, Mo., to Tiptonville, Tenn.; the Ohio River from Louisville, Ky., to the mouth, with portions of the tributary

Cumberland and Tennessee rivers; and the Arkansas River from above Tulsa, Okla., to Pine Bluff, Ark.

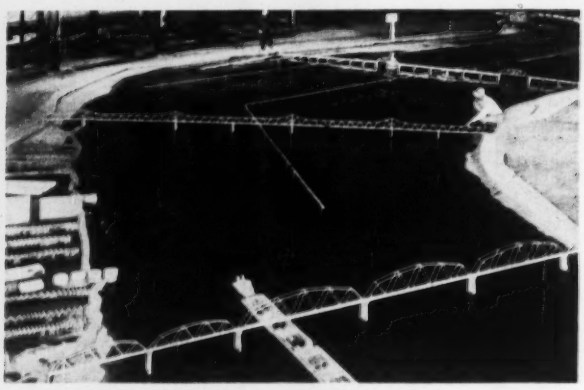
An added aspect of this model is that data collected from it can be transferred for use on a separate model of the Lower Mississippi, from Cairo to the mouth, which is located at the main station at Vicksburg, Miss.

. . . The Waterways Experiment Station

INDOOR MODEL at the main experiment station depicts 50 miles of Savannah River and adjacent harbor area. One of many studies going on at the station, this one is to determine sources of shoaling material and conditions causing deposition of the material.



NIAGARA RIVER AND FALLS model shows intakes on both sides of the river for diverting water to hydroelectric power plants downstream. Investigations were made to aid in design of remedial works necessary to preserve and enhance the beauty of the falls and to compensate for effects of additional diversions of water.



MODERNIZING NAVIGATION FACILITIES is the aim of this model study of six miles of the Ohio River at Louisville, Ky. The most feasible method is being sought for replacing the old lock, canal and dam (near standing man rear) with a larger and more modern structure.

The 820 acre Jackson reservation at which the Mississippi model is located is a suboffice of the Corps of Engineers Waterways Experiment Station at Vicksburg, Miss., 40 miles away.

The 500 acre station was established 28 years ago for the purpose of analyzing and solving—by means of small-scale models—specific practical problems arising in the development of America's rivers (ENR July 16, 1931, p. 84, Dec. 29, 1938, vol. p. 822). But it wasn't long before the scope was broadened.

To the field of practical problems were added fundamental studies leading to the development of design criteria and techniques having general application. It exists today as the principal research, development and testing facility of the Corps in the fields of hydraulics, soil mechanics, concrete and flexible pavement design.

The model studies conducted by the hydraulics division fall in the following principal categories: (1) Investigations of designs for and hydraulic performance of all types of hydraulic structures, (2) Determination of the best designs for and locations of breakwaters for protecting harbors from offshore waves, (3) Studies of the hydraulic improvement of tidal estuaries, (4) Development of flood-control and navigation-benefit plans for inland waterways.

Although the majority of the several hundred model studies carried out since the establishment of the station have been for specific projects, more and more emphasis is being placed upon developing fundamental knowledge applicable to design of hydraulic structures and to the interpretation and forecasting of the action of hydraulic forces in conduits, rivers, harbors, lakes and tidal estuaries. The culmination, in a sense, of this trend is the Mississippi River Basin model.

The station's soils divisions deals

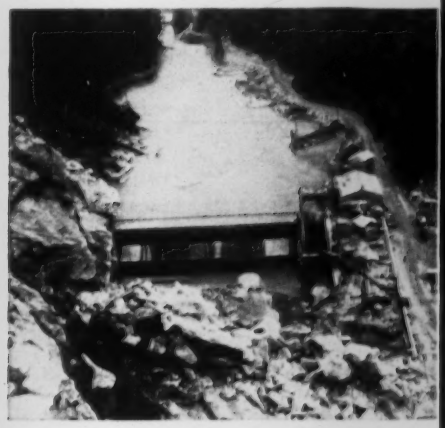
1. A 285-foot dam, the Gorge High Dam, will rise here to capture the power of the Skagit River, 47,000 additional kilowatts of it, for the city of Seattle.

2. Holes are drilled into the overhanging cliff by the drilling crew working for the Merritt-Chapman and Scott Corp., and the Savin Construction Co.

3. Powder men load the charge of Du Pont Gelex® No. 2 into the holes. Maximum fragmentation of the stratified rock is assured by the selection of the proper Du Pont Explosive.

4. The blast is fired with a Du Pont CD-48 Blasting Machine, which does away with the need for setting up and maintaining permanent firing lines or blasting generators.

5. The blast goes off. Four rows of holes, fifty in all, loaded with a total of 300 pounds of Du Pont Gelex® No. 2 dynamite.



6. Here is the result. This picture was taken from the same spot as picture No. 1—but note how the blast has changed the scene.

Du Pont Explosives Clear Way for Gorge High Dam

. . . lighten work of bringing more light to Seattle

Du Pont Explosives have been created to meet every kind of blasting problem, above ground, underground, or under water. Highest quality insures complete dependability. Readily available from conveniently located plants. Around the clock technical assistance always available on every job.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

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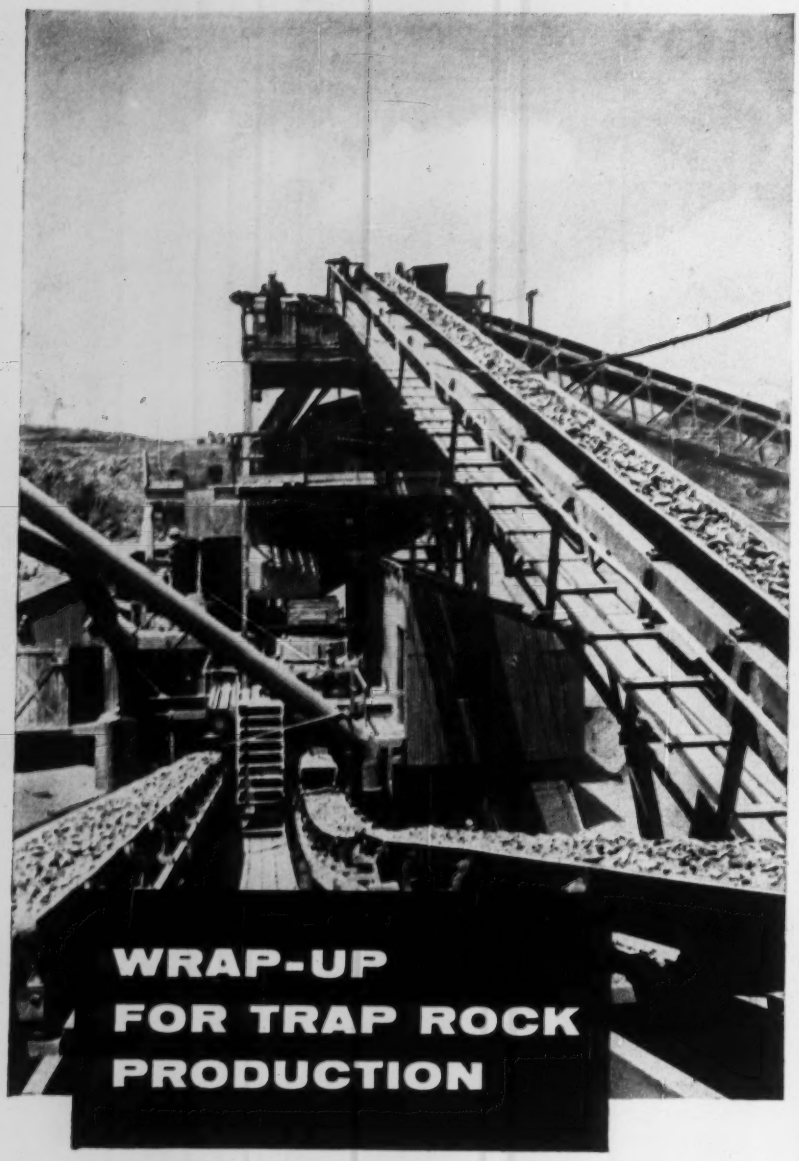
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



At the Kingston Trap Rock Co., this H-R conveyor system has been in operation for over seven years . . . and it's still maintaining peak production at minimum maintenance. Fourteen conveyors, from 175' to 325' long, and from 24" to 42" in width, carry 700 tons of trap rock per hour from primary crushers to surge pile, then to secondary crushers, to screens, and finally to storage.

Here, as in hundreds of other applications, Hewitt-Robins engineered, manufactured, and installed the complete bulk materials handling system. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

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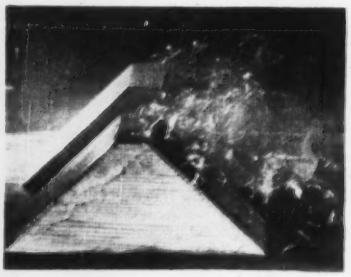
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

with geological and field soils studies, the testing, analysis and design of earth foundations and earthen structures.

In the concrete division laboratories are performed concrete investigations on problems of a general nature in addition to those dealing with specific instances. The technical services division provides a central source of technical information for the Corps.

The Waterways Experiment Station serves all offices of the Corps both here and abroad, and its facilities are also available to other federal agencies. Occasionally, studies are made for state, local and foreign governments and for private firms when authorized by the Chief of Engineers, Maj. Gen. E. C. Itschner, under whose direct control the station is. Present director of the station is Col. A. P. Rollins, Jr.

Stopping the Action for Study



One of the tools used in studies at the Waterways Experiment Station is high-speed photography. Through it, fast action is stopped for thorough analysis of the details.

The rate of growth of a fireball, the formation and development of the plume of underwater explosions, the time of travel of water wavs—this is information obtained from frame-by-frame analysis of film exposed at speeds of 2,000 to 5,000 frames per second.

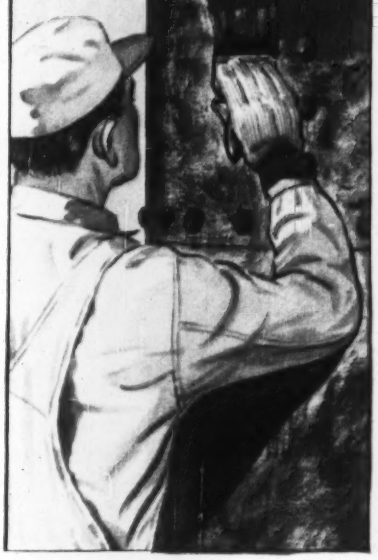
In some cases more than the simple freezing of the action is sought. For example, by use of oscilloscopes and time reference set-ups, collection of precise dimensional and time data concerning the intensity and duration of shock waves is possible.

The accompanying photograph of cavitation trails is an instance of the use of high-speed still photography, which the station also employs. Cavitation traces occuring in variable-pressure water tunnels are photographed at shutter speeds of 1/5,000 sec. These are used in reproducing the phenomena on scale models for study of the causes of the disturbance and for its correction economically. A sequence of pictures under various conditions of velocity and pressure are customarily taken to get an index of the intensity of the action.

Three Rust-Oleum DIFFERENCES that save you time, money and metal!

GOES ON FASTER

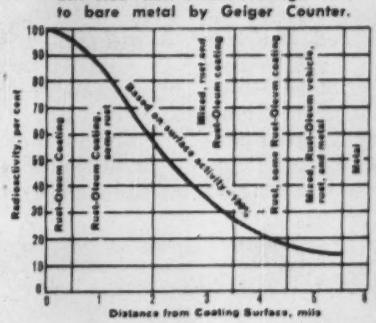
No tedious surface preparations usually required — just scrape and wirebrush to remove rust scale and loose rust — then brush Rust-Oleum 769 Damp-Proof Red Primer right over the remaining rust.



STOPS RUST

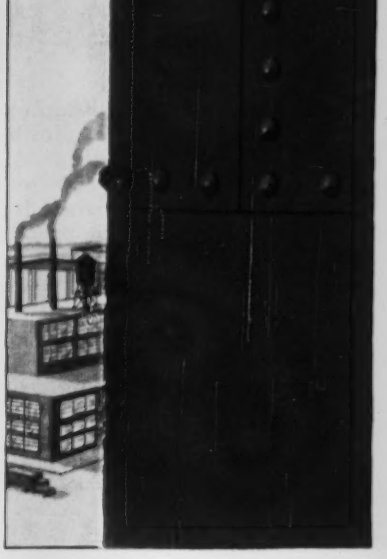
Rust-Oleum's *specially-processed* fish oil vehicle works down through the rust into the tiny, microscopic pits in the bare metal where it drives out air and moisture to *stop rust.*

Chart shows results of tracing radio-activated Rust-Oleum through rust to bare metal by Geiger Counter.



LASTS LONGER

Applied over rust, Rust-Oleum lasts longer for the *over-the-years protection* you need. It resists sun, salt water, salt air, fumes, heat, humidity, moisture, weathering.



These are just a few of many important *differences* that separate Rust-Oleum from ordinary coatings. When you consider that Rust-Oleum covers approximately *30% more area,* depending upon surface condition and porosity . . . and the fact that Rust-Oleum finish coatings, with the same fish oil vehicle, are available in nearly every color for *double protection* . . . it's just good, common sense to use Rust-Oleum. Prompt delivery from Industrial Distributor stocks. Write for illustrated literature with color charts.

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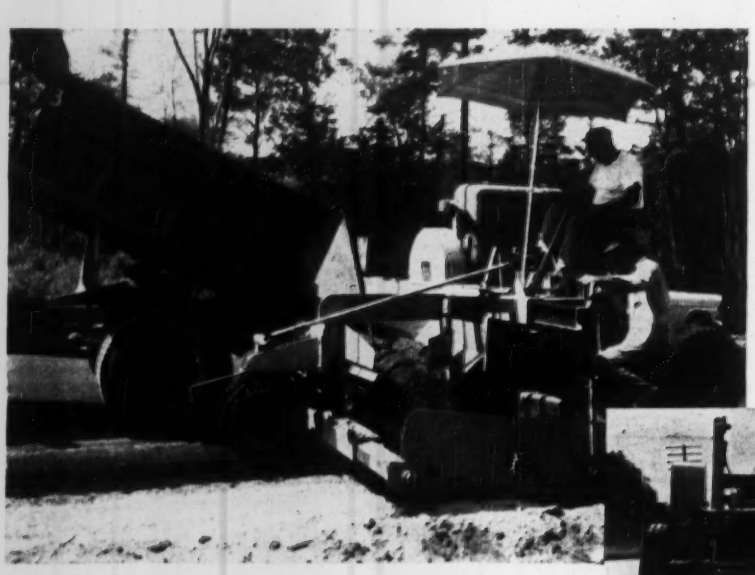
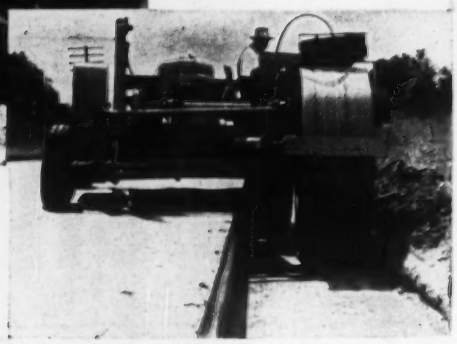
Get all the advantages of Blaw-Knox Bituminous Paving Equipment

For any type of bituminous paving operation, the efficient production of Blaw-Knox bituminous paving equipment will keep operating costs at a minimum. Where big yardages are involved for superhighways, airports or turnpikes the combination of Blaw-Knox PF-90 Bituminous Paver Finisher laying asphaltic concrete on base course material laid by a Blaw-Knox Base Paver will assure big profitable production. Where the jobs are smaller and working area confined such as driveways, parking lots, alleys, play areas, or streets, the Blaw-Knox PF-45 Black Top Paver will give you the kind of production that will mean money in the pocket. When shoulder paving or road widening are involved the Blaw-Knox Road Widener and Trench Roller team will reduce hand labor, wasted material, form setting and rolling time.

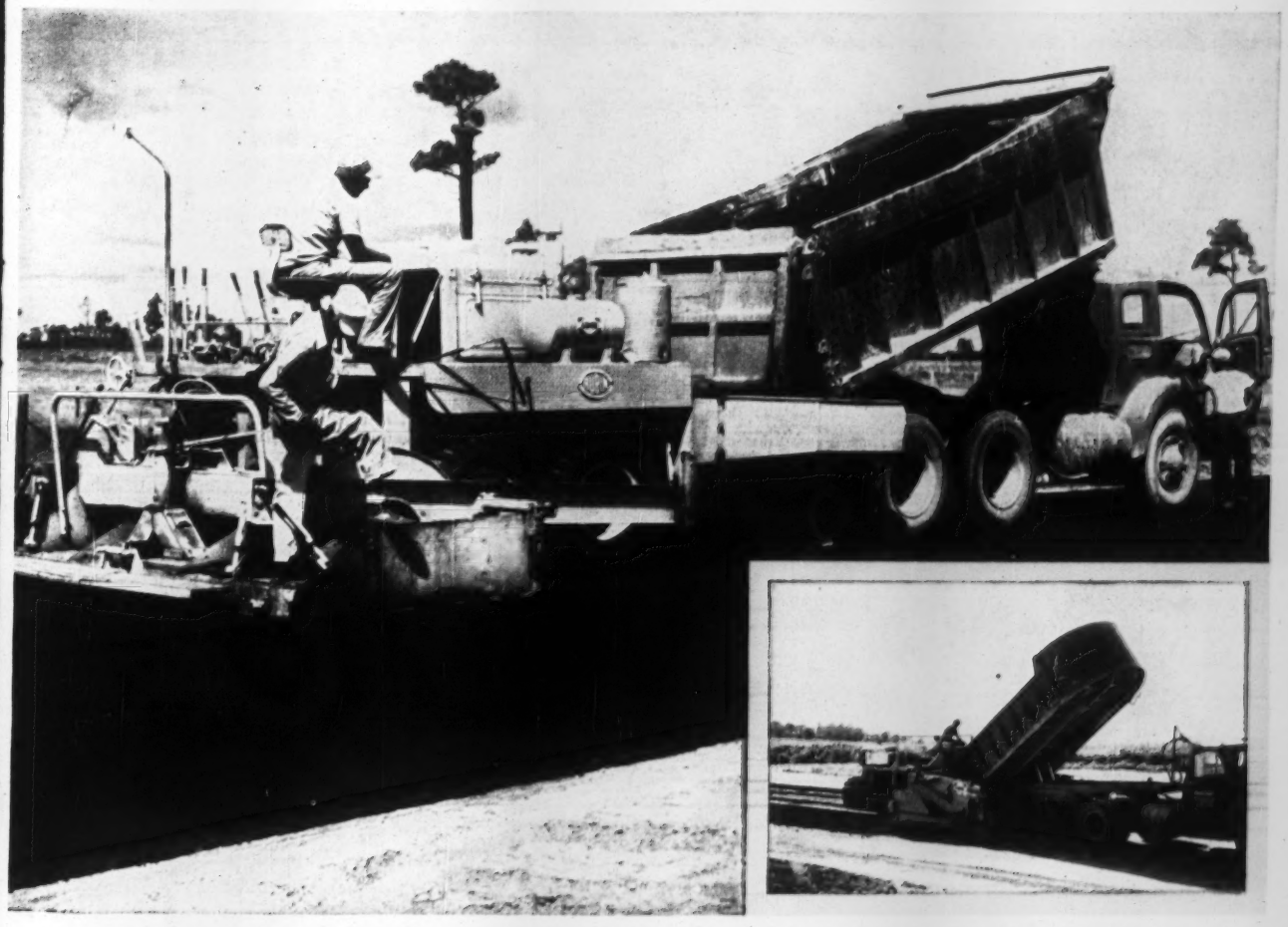
All units in the line of Bituminous paving equipment are engineered to give maximum versatility. They can be adjusted to work in various widths and handle many types of material or mixes. For complete information see your nearest Blaw-Knox distributor.



Road Widener can be used to spread gravel or pave concrete and asphalt on shoulder paving or road widening jobs. They can be adjusted to work from 18" to 10'.



Trench Roller speeds trench compaction in either narrow or wide trenches. Rolling width and depth can be adjusted while roller is in motion.



Model PF-90 Bituminous Paver Finisher has high capacity features for big job production. No other paver offers its combination of rubber-tired mounting, paving speed, paving width, capacity and high travel speed — features that mean more tons per shift on day-after-day jobs.

Model P-150 Base Paver spreads big tonnages of base course material without segregation. Its oscillating screed knits fine or coarse material into an even compact base course that is true to grade and crown.

Model PF-45 Black Top Paver assures big profits on small to medium black top paving jobs. Its rubber-tired mounting, capacity, high travel speed and maneuverability save time and hand labor when working in confined areas or on scattered jobs.

For complete information of the complete line of Blaw-Knox bituminous equipment send for the following bulletins — for the Model PF-90 Bituminous Paver Finisher, No. 2475; for the Model P-150 Base Paver, No. 2457R; for the Model PF-45 Black Top Paver, No. 2539; for the Road Widener, No. 2458R and for the Trench Roller, No. 2497.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division

41 Charleston Ave., Mattoon, Illinois

CAN'T MOVE THE SUBWAY, but new highway tunnel needs room too. So Boston Engineers are replacing the thick concrete arch roof of subway with a flat roof.

SUBWAY ROOF is of 6000 to 8000 lb concrete with 1¼ in. rods spaced 2½ to 3 in. on centers, but contractor found a way to remove it in chunks weighing up to 15 tons each.

Tunnelling

When a road job costs $12,500 per lineal foot, there has to be a reason. And in the case of a $2.5 million, 200 ft long section of the 150 ft wide tunnel that will carry Boston's Central artery under Dewey Square there are many reasons.

To begin with, the tunnel is one of the widest ever built. The Square is undeniably the busiest spot in the city, since each day it is crossed by 250,000 pedestrians and 55,000 vehicles. This congestion requires the construction of temporary detour routes to permanent road specifications. Paving, curbing, sidewalks and lighting are all required in the temporary detour—and then must all be removed when the main crossing is complete.

Further increasing both the cost and job problems, the ground beneath the square is crossed at various elevations and from all angles by literally hundreds of utility installations, all of which have to be temporarily rerouted with no interruption of service.

To complicate matters more, a main line transit tunnel and part of a station cross the route of the vehicular tunnel, with the top of the tunnel's peaked roof projecting more than four feet above the base of the new roadway. Thus, to hold the grade of the vehicular tunnel, it is necessary to eliminate a section of the station, and to remove and replace at a lower elevation, the roof of the subway tube.

For a clear picture of what's going on, even city engineers and contractors working on the job find it necessary to think in terms of several distinct section: subway protection, demolition of the existing subway roof and construction of a new roof, and relocation of utilities and other facilities.

• **Subway protection**—Before the existing subway tunnel roof could be removed, it was necessary to erect a temporary protective structure within the tunnel itself. Since train schedules limited the working hours in the tube to a five-hour period between 12:30 a.m. and 5:30 a.m., this phase of the job was handled by the Metropolitan Transit Authority with its own forces, under the direction of E. B. Myott, superintendent of engineering.

Because the tunnel section is on a curve, and because the existing floor is not parallel to either the old or the new tunnel roof, the preliminary engineering required exacting surveys and careful planning.

A total of 82 tons of prefabricated structural steel had to be erected beside, between, and over the subway

Over Tunnel Makes Road Job Expensive

tracks to support the 6 x 8 in. timbers which now serve as a temporary roof for the subway, and will later act as bottom form for the concrete of the new roof.

The steel was delivered as needed to an above-ground station where it was loaded on MTA work cars. Brought to the work site, the beams were erected by a car-mounted crane with a hydraulic boom. With no storage space available at the site, all materials were unloaded from the cars only as fast as they could be placed.

The erection procedure was this: Vertical center beams were set up first on pedestals previously poured directly on the tunnel floor. To keep a uniformity of steel and simplify construction, the pedestals varied in height for each column. As center columns were anchored they were connected to each other by means of an 18 in., 50 lb. WF beam.

The side supports, which consisted of preshaped 10 in. WF beams, were placed next. An existing shelf served as a base for the side supports and except for small leveling pedestals, little concrete work was necessary.

To obtain maximum clearances, all side supports were set inside of safety notches constructed in the original tunnel. The chipping of existing concrete was therefore reduced to a small area at the point where the walls left a vertical plane to slope inward towards the center.

Because of the necessary bend in the side steel, base anchoring was not sufficient, so the top of the side steel was held in position by adjustable rods set in the concrete tunnel roof.

With the center and side steel placed, the cross beams were set and bolted to the side members. Each transverse member consisted of two 10 in. beams which were bolted to the side steel, but lapped over the 18 in. center longitudinal member. The lapping at the center allowed for any inherent variation in the width of the tube and therefore simplified construction. The placing of the intermediate longitudinal steel between the transverse members completed the steel erection and made further use of the crane impossible.

The roof timbers, which were 6 in. x 8 in. x 12 ft, were placed by men working from the deck of a flat car. The timbers were lagged to the steel and where possible, to each other. The job of protecting the tunnel required only 34 days, but the MTA had other work. Changes in the station required the removal of entrance and exit facilities, so new stairways and escalators had to be installed. The total cost of the Transit Authority work has thus far exceeded $140,000.

The removal of the temporary roof, which can not be done until the floor of the vehicular tunnel above is complete, is expected to take another 30 days, and will cost an additional $40,000.

HORIZONTAL LINE DRILLING (foreground) weakened concrete and provided breakage line. Vertical drillers (rear) cleaned concrete from rods for acetylene cutting.

JACK with 10 pistons goes in line hole.

CONCRETE CRACKS under 150 ton lift.

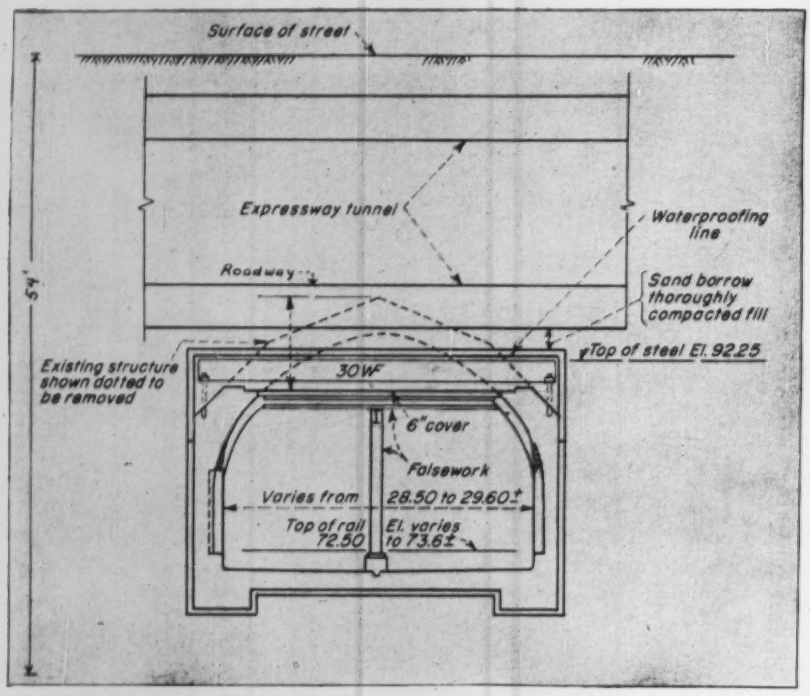
• **Demolition**—While the erection of the temporary inside roof is left to the MTA, demolition of the peak of the old tunnel roof is part of the work to be done by V. Barletta and Co., general contractor on the tunnel construction.

Small though the quantity of demolition seems, the job is tough. The roof of the existing structure is an extremely high strength (estimated at 6,000-8,000 psi) concrete ranging in thickness from 3½ to 4 ft, and containing 1¼ in. rods at from 2½ to 3 in. on centers. To further complicate the demolition, the entire roof is covered by a solid sheath of 4 x 10 timbers, which during construction of the tunnel 42 years ago, served a support for the earth above the hole and was concreted into the roof. Four decades has in no way reduced the strength of the timber and its removal by axe and sharpened clay spade is a slow and tedious operation. In the actual removal of the thick concrete roof, Barletta is using a tubular-shaped hydraulic machine called a Duncan Rok-Jak.

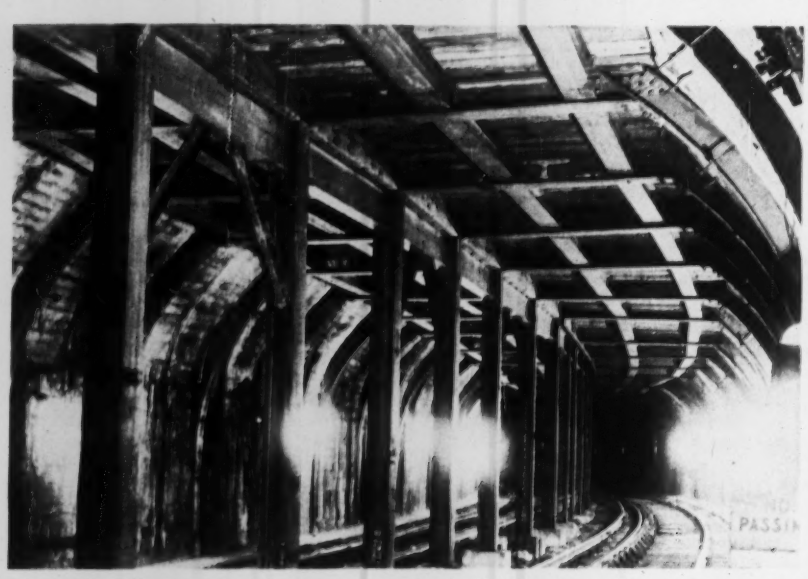
• **The procedure is this:** after the removal of the waterproofing and the timber lagging, jackhammer crews start on the concrete.

Actually the jackhammer work consists of three separate operations. A key is first cut in the peak of the 34 ft wide roof. This key is approximately

. . . Relocation of utilities boosts costs of tunnel



TUNNEL UNDER A TUNNEL—Subway had peaked roof which would have projected into vehicular tunnel roadbed even though subway tunnel base was 54 ft below street level.



ROOF UNDER A ROOF—Before removing the top of the subway tube, it was necessary to erect a temporary roof within the tube. Setting beams in safety notches added clearance.

1½ ft wide at the top and 6 in. wide at the bottom of the slab. The slab is then line drilled on 4 in. centers to its full thickness in such a way as to cut the slab into 5 ft strips. Simultaneously with the line drilling, chipping crews clean the concrete from around the rods. With line drilling complete and the rods exposed, buring crews go to work at cutting the steel.

During the line drilling, one hole is bored to a diameter 3¼ in. In this hole is inserted a 150-ton Rok-Jak. The jack has a diameter of 3 in., is 2 ft long and contains 10 individual pistons each capable of exerting 15 tons of pressure. To distribute the push of the individual pistons, steel plates slide in on top of the unit between the pistons and the concrete. A small pump connected to the jack by a flexible tube provides the pressure to work the jack. As the jack pistons are raised, the concrete develops cracks which follow along the line holes.

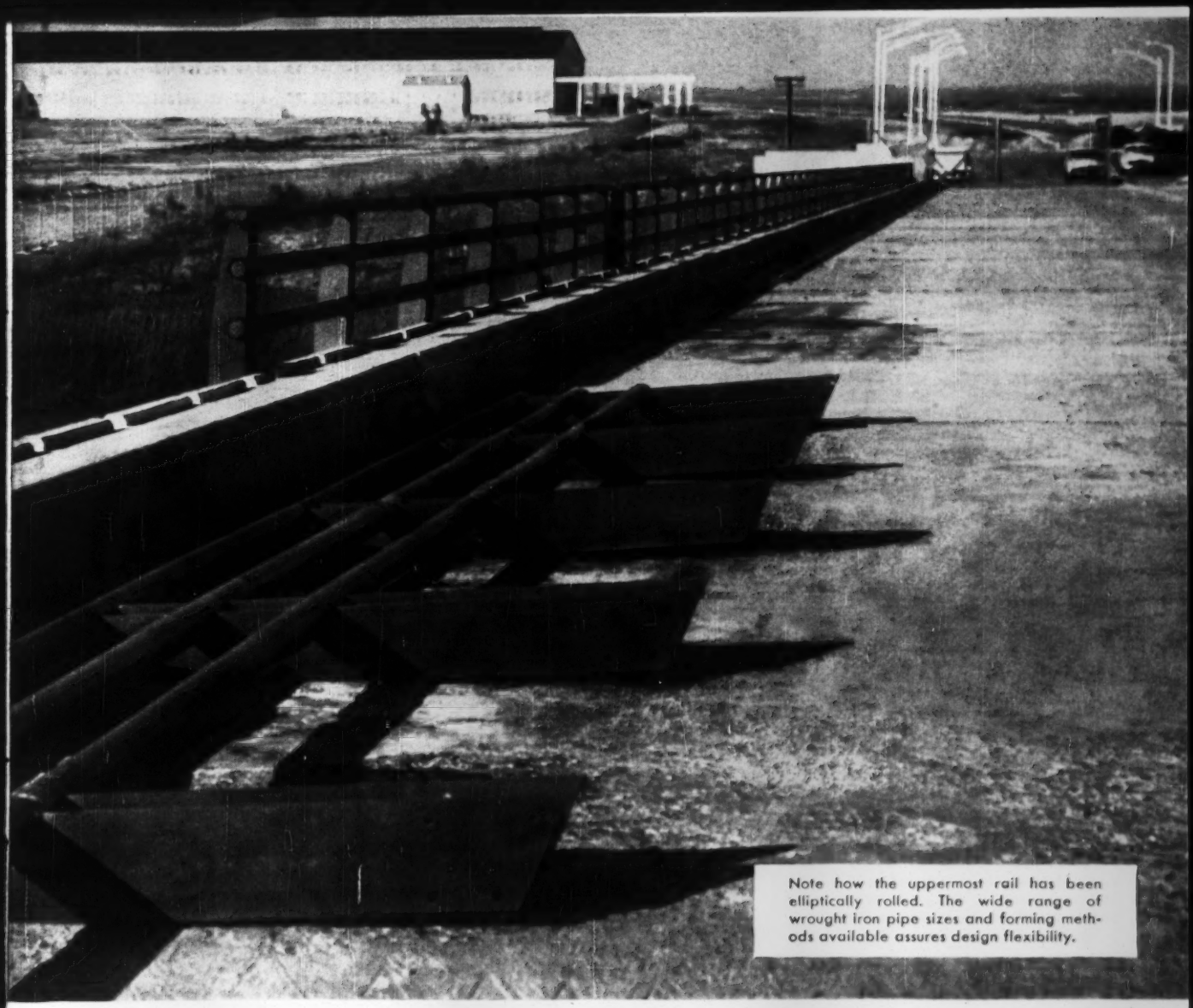
Use of the jack virtually eliminates the need for a "headache ball" and permits removal in one piece of 5 ft wide sections up to 11 ft long. Several single pieces of concrete removed have weighed as much as 15 tons.

The total cost of the work being done by Barletta in the Dewey Square area, including the tunnel construction, (ENR Jan 10, p. 36) will exceed $1.5 million.

• **Utilities**—There is one other complex operation involved in the Dewey Square crossing—removal and rerouting of utilities. Because the utilities crisscross the road tunnel cut at various elevations and from all angles, it is impossible to pin-point the costs for rerouting any particular section. However some idea of the magnitude of the job is evidenced by the fact that the Boston Edison alone is spending $2.4 million for rerouting of its facilities in a 1.8 mile stretch between the Charles River and Dover Street. More than half this expense comes in the 2,500 ft tunnel section between Oliver and Kneelands Streets.

In all, Edison engineers expect to cut and relocate over 360 cable lines—most of them big ones. The tunnel as located stands between the Edison Company's large power plant in South Boston and the principal load being carried by the station. Practically all of the main cables from the South Boston plant are affected by the tunnel cut. These cables comprise the main transmission lines as well as direct current and low tension alternating current cables for local distribution, and they include power for the city's street lighting system.

In addition, four of the company's large transformer vaults are to be abandoned and relocated away from the area. Before the job is finished, Boston Edison will have installed about 740 new ducts aggregating 40 to 50 miles in length, half of which will be put into immediate service with the remainder available for the expansion of facilities. Two 16 in. and one 8 in. high pressure steam lines are also affected. In the relocation of the utilities, there is no short cut. They must be found by careful excavation, diverted temporarily and then, as permanent locations become available, be replaced (ENR Jan 10, 1957, p. 36). Many of the lines are already being carried by the two utilities tunnels constructed under the vehicular tunnel roadway. Some are still being carried by H-beam bridges spanning the open sections of the cut, while many have yet to be uncovered.



Note how the uppermost rail has been elliptically rolled. The wide range of wrought iron pipe sizes and forming methods available assures design flexibility.

Durable Wrought Iron bridge railings work easily in the shop—go up fast on the job

Wrought iron bridge railings meet the requirements of the entire roadbuilding team. Here's why.

For engineers and state highway people responsible for safety—as well as reduced costs—railings of wrought iron offer both. Wrought iron's structural strength gives it high impact resistance. And since wrought iron is not affected by attack from concrete, no special coatings are needed. Important too, is wrought iron's resistance to corrosive atmospheric conditions—another essential for long service life.

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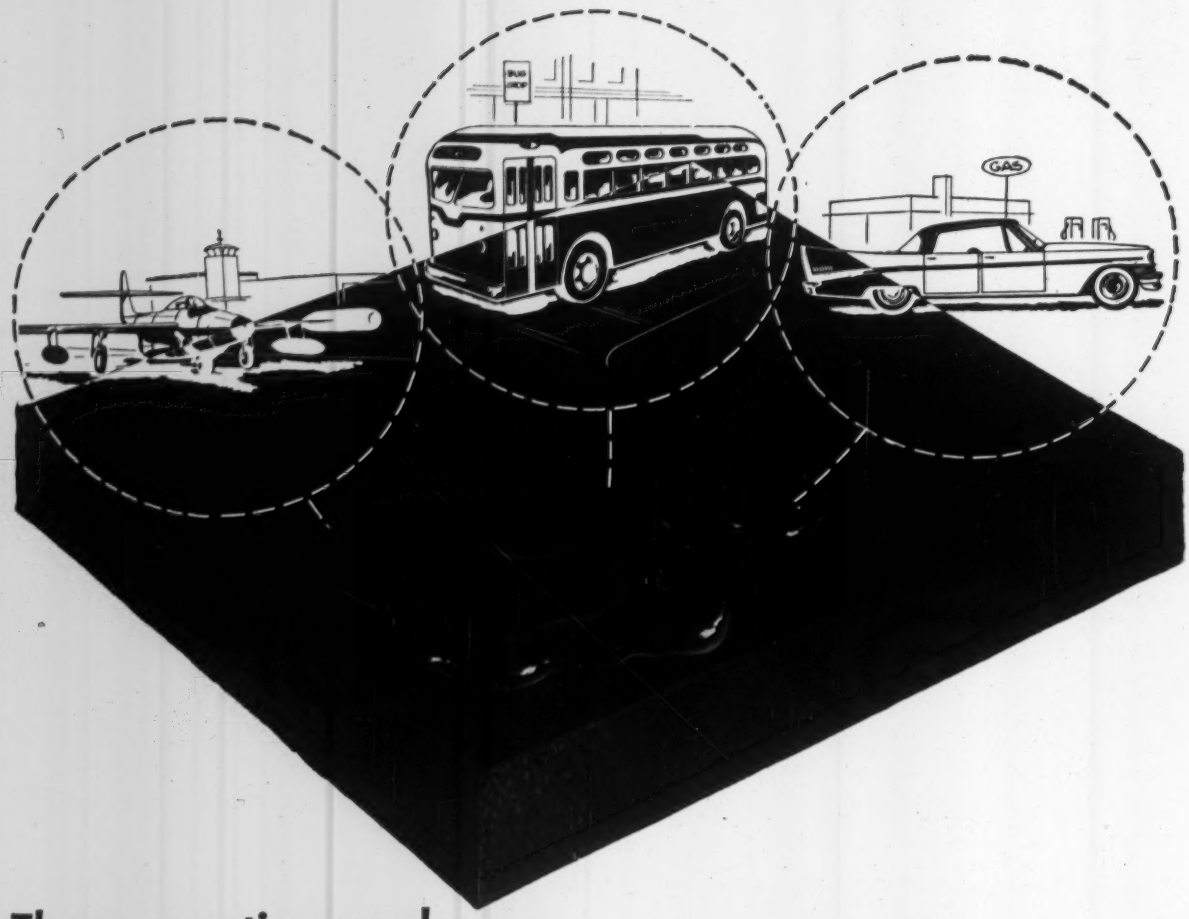

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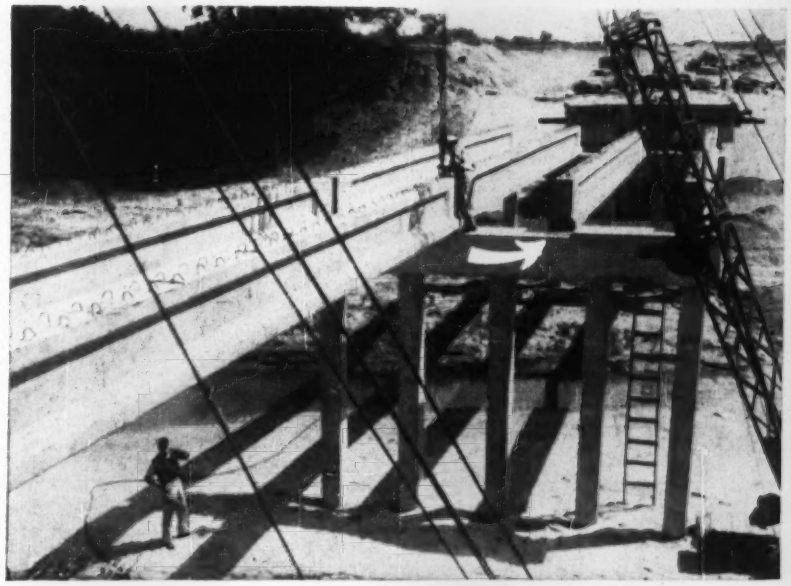


PRESTRESSED BEAMS for bridge near Victoria, Texas, are seated on . . .

NEOPRENE RUBBER bearing plates.

Rubber Seats for Prestressed Beams

James R. Graves
Senior Designing Engineer
Texas Highway Department
Austin, Texas

A neoprene plate has been developed by the Texas Highway Department Bridge Division to be used as a bearing material for precast, prestressed concrete beams. The neoprene plate was used for the first time in seating 53 ft long prestressed beams for a bridge near Victoria, Texas.

The problem of seating precast members is most serious where heavy loads cause high bearing stresses and relatively large rotations at the bearings. In prestressed design, in particular, where span lengths are longer than with reinforced concrete, a positive and dependable bearing is necessary.

Portland cement, asphaltic fiberboard, steel rockers and lubricated metal sliding plates have been used in attempting to find a satisfactory and economical seating material. Each has some objectionable feature, either poor functioning or lack of economy. Some metal bearings used with beams in bridge work cost almost as much as the beams they support.

An acceptable beam bearing must (1) provide a smooth and uniform transfer of load from the beam to the substructure; (2) permit beam rotation at the bearing due to deflection of the beam under load, and (3) allow lateral and longitudinal movement of the beam due to thermal forces. In addition, the bearing must be economical, dependable and durable, and should be easily maintained or maintenance free.

The neoprene bearing plate used in Texas is made of a highgrade synthetic rubber, highly resistant to oil, sunlight and weather. Made in a wide range of hardness, it has an extremely long life. Tests show that a durometer hardness of about 70 is the most desirable.

Texas designs allow a dead-load bearing stress of 300 psi. Combined dead load, live load and impact bearing stress should not exceed about 800 psi.

• **Plate dimensions**—To permit beam rotation and longitudinal movement, the neoprene plates are held to a width of 6 to 8 in. in the direction of the beam axis and are at least the full width of the bottom flange of the beam in the other direction.

Thickness of the plate must be increased as the span of the beam increases. An increase of 0.10 in. in plate thickness for each 10 ft of span is considered adequate. However, one inch is the maximum thickness that should be used in a single plate, since the rubber tends to "bulb out" on the sides when used in thick pieces. Where thicker bearings are indicated, a series of plates should be built up with a restraining material between. Since the neoprene plate tends to adhere to the concrete surface, the plate is not expected to creep or move from its initial position. The beam under thermal movement will flex the neoprene rather than slide on it. This small amount of working will help keep the rubber alive.

No rigid connection between superstructure and substructure is permitted, because the neoprene bearings will compress under live loading. A ½ in. thick plate loaded to 250 psi will compress about 1/16 in.

The cost of these plates represents only a small percentage of the total cost of the prestressed beam. The neoprene bearing plates appear, at this point, to be a logical answer to the seating problem for prestressed beams.

Catastrophe Plans Aired By U. S. Corporations

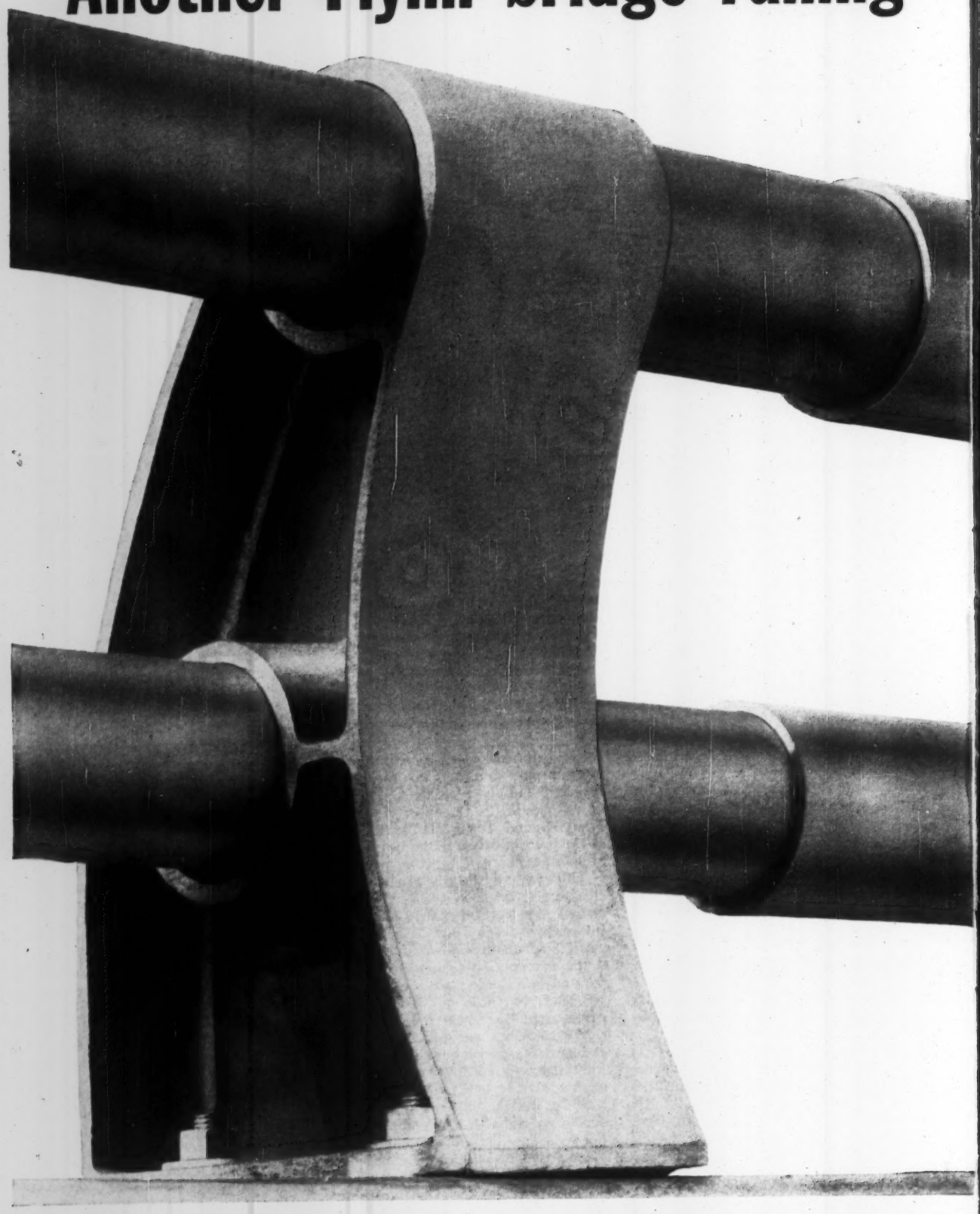
U. S. industry favors dispersal as a defense against enemy attack but has no enthusiasm for going underground or building bomb-resistant plants. At least these are the conclusions indicated by the results, just released, of a Washington seminar on catastrophe planning, sponsored by the Commerce Department's Business and Defense Services Administration.

Most companies that expressed opinions on dispersal thought the best defense was to get out of vulnerable areas. 15 out of 18 favored building new plants elsewhere ahead of time. Only 10 out of 15 are considering moving existing production facilities.

Nothing has been done about moving underground. Two companies said, however, that they are considering such a move.

Structures resistant to bomb or fall-out damage have few adherents, according to the seminar results.

Another Flynn bridge railing



installed to be forgotten

Lightweight aluminum, it will never rust, never need paint. On the new Hampton Roads (Norfolk, Va.) Bridge, this lightweight Flynn railing has been installed for good—in fact, to be forgotten. Maintenance crews can forget about painting and repairing it, because Flynn railing, rail seats, end posts, balusters, anchor bolts, and accessories are made of non-rusting, durable aluminum.

And Flynn extrusions are engineered for maximum strength with minimum weight; nothing short of an accident will make replacement necessary.

In the wide range of Flynn highway- and bridge-railing styles, there should be many that will meet *your* immediate needs. Flynn can also produce custom designs to your specifications . . . in any quantity, large or small. On either stock or custom orders, Flynn delivery is fast and reliable.

Before you bid on your next job involving highway or bridge railing, investigate the many economies of dealing with Michael Flynn.

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The simplicity of the Paceco Dual Torque design reduces first cost and lessens maintenance. The variable hoist speeds save time in placing hook for lifting, speeding hook movements as much as 5 to 1.

By using a single hook and a single trolley hoist in place of a double hoist trolley, operators benefit by better hook approaches to the runway rails and an expanded working area under the crane.

The Paceco Dual Torque mechanism may be used on both gantry and bridge cranes.

Besides cranes, Paceco designs and fabricates all types of major mechanical equipment. May we send you our illustrated brochure on such products?

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Lever on Rails Lifts 71 Ton Beams

A prestressed concrete fabricator has developed a novel method for lifting and moving heavy beams from the casting bed to a storage site without cranes. He uses a lever set on rails and a small jack supported on the beam to be lifted.

Precast Concrete, Inc., Lakeland, Fla., was to produce 34 beams, each 100 ft long and 11 ft high. The 71 ton weight of the beams was beyond the capacity of the yard crane to handle, and to rent two mobile cranes would be too expensive.

The casting schedule called for one beam to be produced each day and four beams to be released and moved from the bed to storage the same day.

To solve the lifting and moving problem, Roy N. Hill of Lakeland Engineering Associates, Inc., designed a hoist consisting of a lever on wheels activated by a small jack placed on top of the beam to be lifted and under the end of the level. The fulcrum of the lever is atop an A-frame that rolls on a rail. Threaded clevises pinned to the lever a short distance away from its fulcrum are attached to lifting bolts cast vertically into each end of the beam.

As the jack opens, it raises the lever. Because of the mechanical advantage due to the application of the jacking force at a much greater distance from the fulcrum than the lifting force, the beam is raised, even though the jack bears on the beam.

The A-frame at each beam end, after the beam is lifted, is pulled to the storage area.

Roofs Supply Water

Lakes catch 1.8 million gallons of rainwater

Five acres of roof and five acres of parking lot will shed rainwater to lagoon storage of all the industrial water used at a new $2.3 million metal fabricating plant near Chicago. This is how Flick-Reedy Corp. solved the water problem for its new plant being built in Du Page County, Ill. It will draw all water for industrial use and air conditioning from two man-made lagoons.

Recent rezoning of residential and agricultural country took care to protect against excessive industrial use of groundwater. And the company did not want to depend on the nearest public source of water supply, the village of Bensenville, about a mile away. It was determined that a completely internal water and sanitary system was the solution. The system which evolved combines the collection system, two reservoir lagoons, and a third sanitary system lagoon.

Rainfall draining off the parking lot, and the roof area of the 220,000 sq ft plant is collected in the two reservoir lagoons, each of which is 75 ft wide, 600 ft long and 5 ft deep. Maximum capacity is 1,800,000 gal per lagoon. Each inch of rainfall is figured as a potential 10 in. rise in the small lakes. No treatment is needed before use.

Water drawn from the reservoirs for "clean" uses, like cooling and heat treatment, is returned to the lagoon from which it is drawn. When used for such operations as ferric oxide plating, it is carried off in waste lines to a holding tank where sediment and heavy waste separate, and the water is chemically neutralized. Next is goes to a small aerator type sewage unit similar to sewage treatment plants used in small communities. After treatment it flows to the sanitary lagoon. Water for drinking and other personnel uses will be drawn from a deep well on the plant site, and sanitary sewage will be handled by the same disposal unit that accommodates industrial waste.

The system will provide Flick-Reedy with up to 18,000 gallons of water per hour at a cost estimated at approximately ½ cent per thousand gallons. The company produces industrial and hydraulic cylinders.

The chairman of the Du Page county board of supervisors says, "It is a tribute to Flick-Reedy that its new plant meets, and even exceeds, our requirements."

MAN-MADE LAKES collect and supply all the water needed by the new Flick-Reedy plant. This completely internal water system uses water from plant roofs.

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The responsibilities of this job are great, and the rewards are in proportion to the effort invested. You'll be selling the finest bridge railing of its kind (read more about it and about us on pages 68-69 of this issue of EN-R), made to *your* specifications by one of the most respected names in metal-products manufacture—Michael Flynn.

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Books

Intuition in Design

STRUCTURES—By Pier Luigi Nervi. 118 pp. F. W. Dodge Corp., New York, N. Y. $6.95.

The author, who has developed a world-wide reputation as a designer and builder of thin-shell reinforced concrete structures, expresses in this book his enthusiasm for this material and his philosophy of structural design. He strongly favors design by intuition over mathematical calculations based on elastic theory and recommends use of models to check designs.

Professor of structural design at the University of Rome in Italy, and head of Nervi & Bartoli, engineers and builders, Mr. Nervi does not use ordinary concrete for his thin-shells. Instead, he employs a material he calls Ferro-Cemento, which consists of several layers of mortar and wire mesh. This material and its applications are described in a chapter of the book.

The rest of the text is devoted to his theories of structural behavior, suggestions for improving building design and illustrations of the daring thin-shell structures he has designed and built.

Mr. Nervi does not deny the usefulness of the elastic theory of structures. But he contends that the theoretical results are only "a vague and approximate image of physical reality." Furthermore, most highly complex structures cannot be analyzed by mathematical theories, and the few that can be are checked after they have been designed. Thus, the designer must resort to intuition and schematic simplifications, he argues. He concludes that model analysis is the only possible approach when the problem is too complicated to permit an analytical solution.

In explaining his theory of concrete design, Mr. Nervi offers some comments that may shed light on recent failures at inflection points of reinforced concrete rigid frames in the U.S. Stress concentrations, he points out, are responsible for both capillary and large cracks. Hence, dimensional discontinuities between adjacent elements, as well as substantial differences in the steel areas at the different sections of a member, should be avoided.

"The importance of this principle is shown by the behavior of roof beams in which bars are bent up at the quarter points, or of so-called beams with reinforcement of uniform strength. Some time after they are poured, many of these beams, particularly those that are narrow and deep, develop numerous fine cracks, more or less inclined and extended through the whole depth of the beam, in the region where the bars are bent or decreased in number—that is, where the bending moment is minimum. . . . The cracks develop almost always where the steel reinforcement is suddenly interrupted or bent, showing once more that the stress flow follows much more complicated patterns than those indicated by our simplified theoretical assumptions."

Mr. Nervi recommends use of horizontal bars symmetrically located near the bottom and top of beams and well connected by single or multiple stirrups throughout. He believes the best steel ratio to be in the order of 8 lb per cu ft. Particular attention should be given to the regions where the reinforcement changes direction substantially.

Prof. Mario Salvadori, of Columbia and Princeton Universities, and his wife, Giuseppina, have done an excellent job of translating the book from the Italian.

Cooling Applications

AIR CONDITIONING-REFRIGERATING DATA BOOK (Applications Volume)—Sixth Edition, W. R. Woolrich, editor-in-Chief. 1,100 pp. American Society of Refrigerating Engineers, 234 Fifth Ave., New York 1, N. Y.

The new edition of this reference work on air conditioning and refrigeration contains 60 chapters, written by 90 experts. Eight chapters have been completely revised, and 26 others brought up to date.

Published biennially, the Applications Volume supplements the Design Volume, the ninth edition of which was published late in 1955. The latter covers fundamental data and basic engineering information.

In the Applications Volume, specific applications are described in detail. Several sections deal with refrigeration in food industries, warehouse practices and low-temperature applications. But architects and engineers will be particularly interested in those covering comfort air conditioning in stores, restaurants, residences, theaters and industrial buildings and the use of refrigeration in construction operations.

The book points out that refrigeration is being used for rapid cooling of concrete in mass structures, solidification of foundation materials and air conditioning of structures to control corrosion and growth of organisms. In addition, cakes of ice sometimes are used to lower heavy structures onto supports. Several examples of these applications are described.

(*Books continued on p. 76*)

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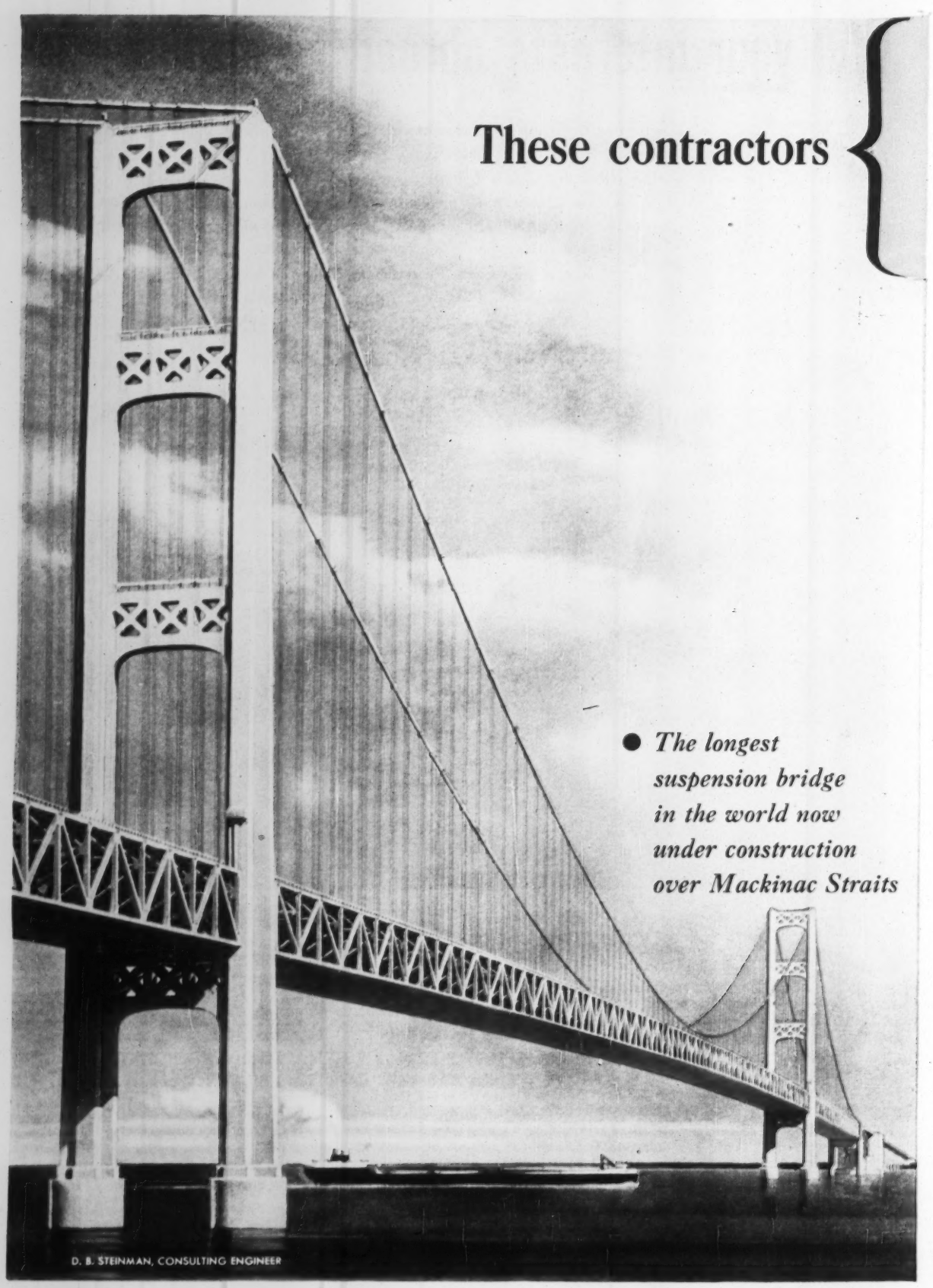
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● The longest suspension bridge in the world now under construction over Mackinac Straits
D. B. STEINMAN, CONSULTING ENGINEER

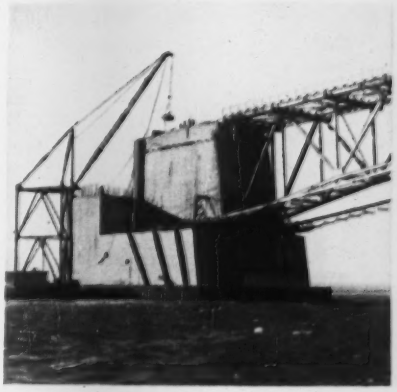
Merritt-Chapman & Scott Corporation and American Bridge Division of U. S. Steel Corporation

use Shell Lubricants in the construction equipment on Mackinac Bridge project

Today's engineering knowledge and modern construction equipment are making the mighty Mackinac Bridge a reality. This equipment requires oils and greases which will remain stable and give adequate lubrication at extreme temperature ranges. To keep their heavy-duty machines operating at maximum efficiency with a minimum of down time, both companies, Merritt-Chapman & Scott Corporation and American Bridge, chose Shell Lubricants and Fuels.

The Mackinac Bridge project is just one of the many construction operations where equipment was lubricated and protected by Shell products. Wherever *heavy-duty* equipment operates, Shell Lubricants and Fuels are being used to keep machinery in top operating condition and hold maintenance costs down. Perhaps it will pay you to investigate the savings that can be realized through the use of Shell Industrial Lubricants and Fuels.

American Bridge Division of U. S. Steel Corporation has strung a total of 12,500 tons of cable as part of the 66,500-ton superstructure.



One of the 34 piers of the bridge substructure built by Merritt-Chapman & Scott Corporation

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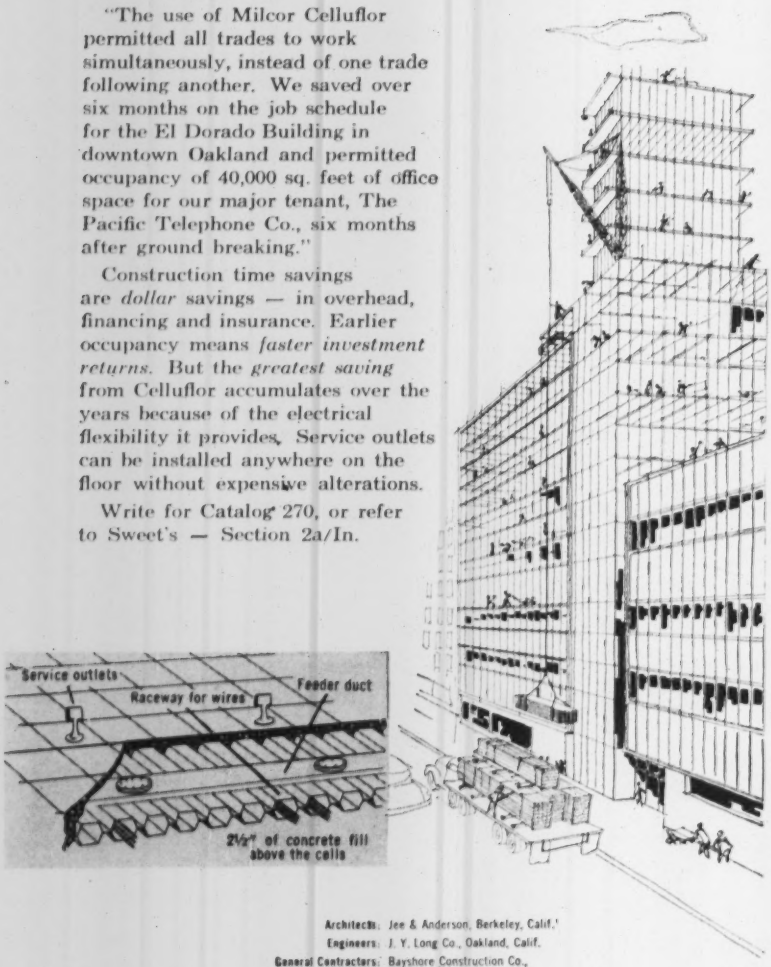

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. . . Books

Concrete Technology

COMPOSITION AND PROPERTIES OF CONCRETE—By G. E. Troxell, H. E. Davis and J. W. Kelly. 434 pp. McGraw-Hill Book Co., New York, N. Y. $7.75.

This book deals with the science of producing good concrete. It covers the proportioning and mixing of the various ingredients, as well as placing and curing of the concrete, to produce a finished product of suitable and predictable quality and economy.

The book is divided into two parts. Part I presents information on proportioning, testing and control of plain concrete. Part II offers instructions for laboratory work. In addition, much useful data are given in nine appendixes.

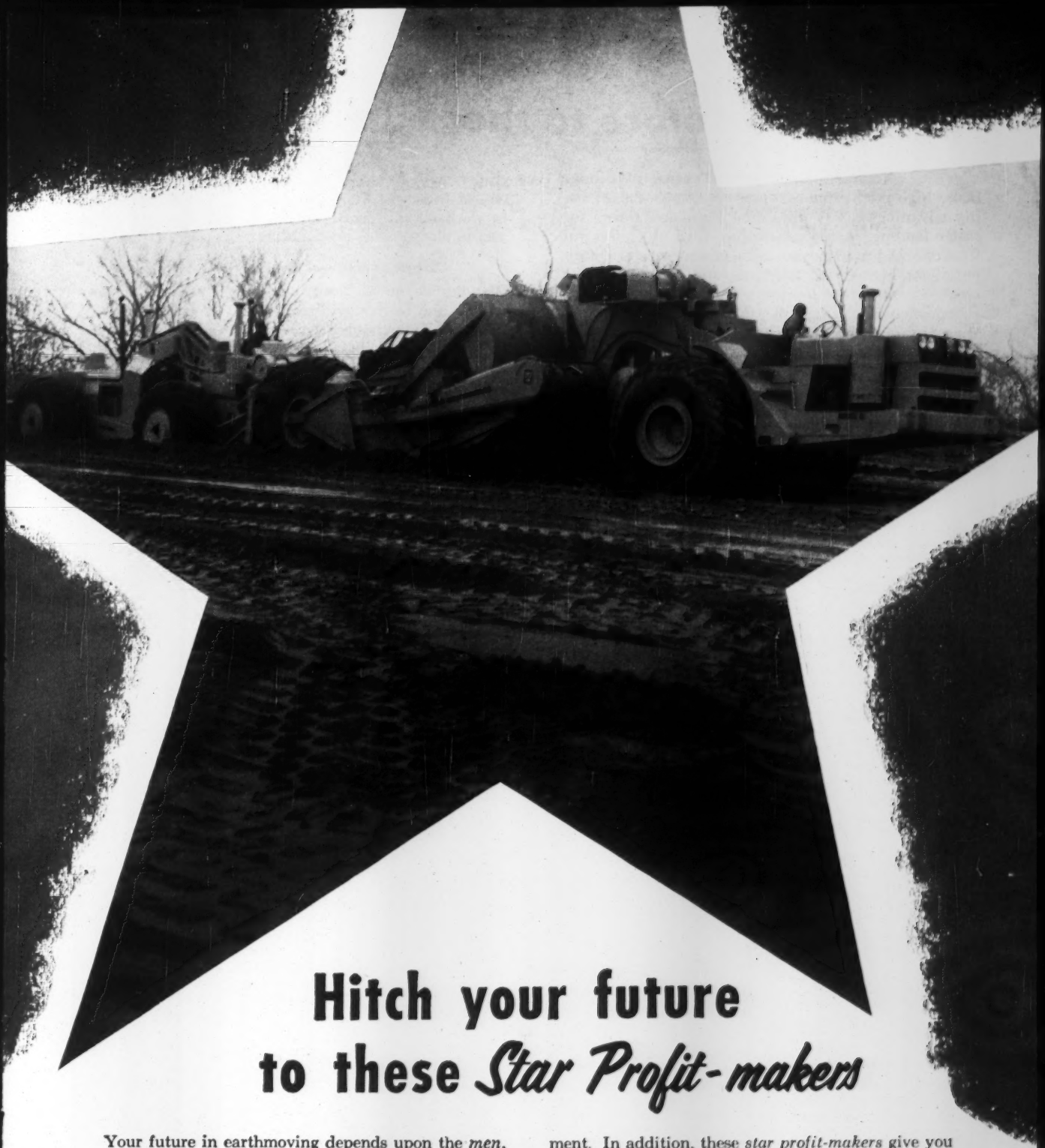
The first few chapters summarize the properties of portland cement, aggregates, water, admixtures and miscellaneous materials, as well as of fresh concrete. Several chapters then explain the principles of proportioning mixes, manufacturing concrete and placing and curing. One chapter covers formwork. The rest of Part I deals with inspection and the properties of hardened concrete, such as permeability, durability, volume changes, creep, thermal conductivity and fire resistance. Heavyweight, lightweight and sprayed-on concrete also are discussed.

Although this book was written primarily for use as a text for undergraduate courses in plain concrete, it also should be of value to engineers as a reference work.

Reports & Pamphlets

• **Military Sanitary Problems**—A 418 page U. S. Navy publication on problems in water supply and waste disposal encountered at advanced military bases contains some useful information for the profession at large. It reports a three day symposium held in 1953 at the Civil Engineer Corps' Research and Evaluation Laboratory, Port Hueneme, Calif., focusing on standardization of equipment components, coagulation problem in pretreatment of water, sewage disposal in arctic regions and difficulties caused by sealing in distillation equipment. The report, PB121037, is available for $7 from Office of Technical Services, Department of Commerce, Washington 25, D. C.

THE NETHERLANDS SPECIFICATIONS FOR PIPE MADE OF HARD PVC AND SOFT POLYTHENE AND THE RESULTS EXPERIENCED WITH THESE MATERIALS—Communication No. 1 of the Committee for Plastic Water Pipes. KIWA, The Hague.



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Your future in earthmoving depends upon the *men, machines,* and *management* you can put together as an organized work team. Your objective is to handle bigger yardages, in shorter time limits, at bigger profits. Among the *star profit-makers* necessary to put you "on top" are modern machines that will *work* faster, *travel* faster, and operate at *higher mechanical efficiency.* You get these important advantages in job-tested LeTourneau-Westinghouse equipment. In addition, these *star profit-makers* give you the balanced combination of power, traction, speed, and mobility — necessary to increase production and pay you a bigger return on your investment in equipment and personal effort.

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Check the complete line of job-tested LeTourneau-Westinghouse equipment including self-propelled scrapers . . . go-anywhere rear-dumps . . . powerful, heavy-duty, rubber-tired tractors . . . and heavy-duty graders with 15 speeds for higher work capacity. Every one of these machines offers you special advantages in work ability, speed, and mobility — important to you in planning for new opportunities.

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Standardize on LeTourneau-Westinghouse earthmovers and be money ahead. Many components and parts are interchangeable between various machines to lower your parts inventory and equipment investment. In addition, similar design features will enable your mechanics and operators to become more proficient in their work . . . help you cut costs . . . earn *extra profits.*

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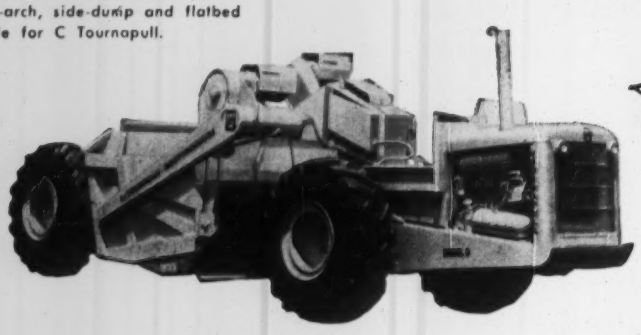
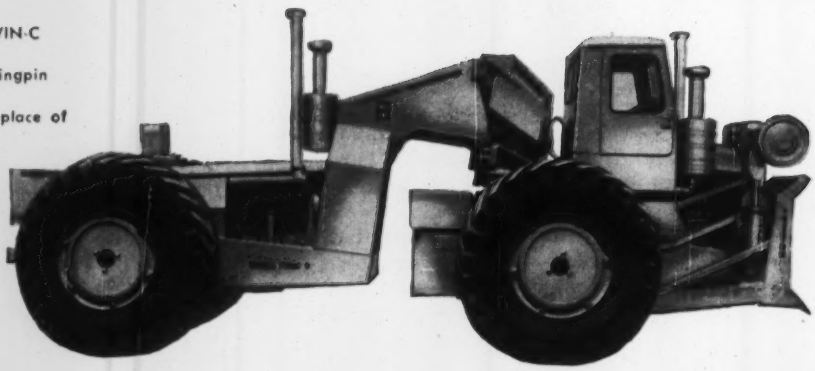
Fullpak scrapers have an established record for easy loading. Its job-proven design has been in world-wide service for over a year on fast-loading 18-yd. C Tournapull. Low, wide Fullpak bowl loads *faster* . . . boils *better* . . . fills corners and heaps low-void payloads. Low push-block is right height for all push tractors . . . carries thrust direct to blade for maximum cutting power. Available with 210 hp C Tournapull and 293 hp B Tournapull. Both prime-movers interchange with rear-dumps and crane. Bottom-dump, logging-arch, side-dump and flatbed available for C Tournapull.

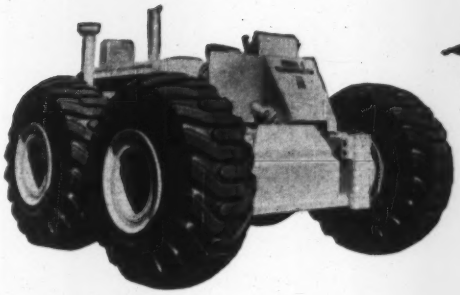


9-yd. D Tournapull-scraper —

Your "handyman" tool . . . handles any kind of dirtmoving, from odd-lot clean-up jobs to production hauling. Works alone or in fleets. Only 8' wide, and within 9-ton axle-load limit, 29 mph "D" travels anywhere without permit. Prime-mover interchanges with rear-dump, logging-arch, crane, flatbed. Bulldozer blade also available.

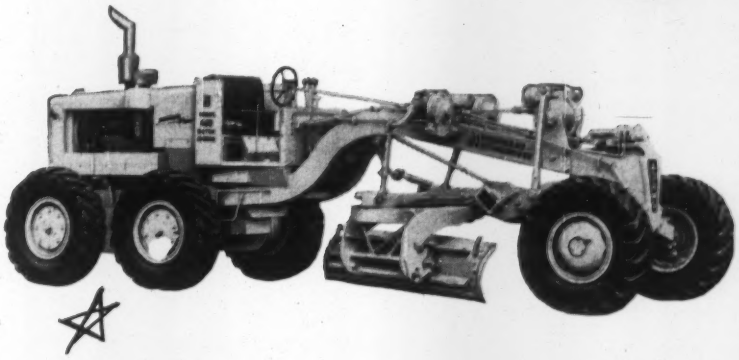
Twin-C Pusher — Giant 420 hp TWIN-C Pusher, with 80,000# of weight. Loads biggest scrapers easily . . . has geared kingpin power-steering . . . travels at 20 mph forward, reverse to 5.8 mph. Takes the place of tandem pushers for your big scrapers. Gets bigger loads fast, at less cost.





Tournatractor — 210 hp Model "C" of 30,000 + # ... works and travels on-or-off roads to 17.2 mph forward, 7.3 mph reverse. Push-plate, Dozer blade, Angle-dozer, Root Rake, V-Snow Plow, Snow Wing, Winch, Tree Pusher, and Power-Control-Unit also available. Versatile Tournatractor dozes, clears, push-loads, skids, tows, operates electric-control scrapers. With RR coupling at rear, unit becomes SwitchTractor. New 210 hp, off-track SwitchMobile also available for RR switching.

Rear-Dumps — 11, 22, and 35-ton haulers have bodies with triple-layer, all-steel floor . . . haul on-or-off highways at speeds to 34.4 mph. Unit makes continuous U-turns in less space than Rear-Dump's own length. In dump position, it turns in only about ⅔ of overall length! These electric-control haulers dump clear over bank, pull out safely with front-wheel drive. Interchangeable scrapers, bottom-dumps, side-dumps, and flatbeds also available.



TraveLoader Self-propelled, belt-type machine with choice of 55 hp gasoline or 60 hp diesel engine. Picks up and loads loose materials into trucks from windrow or stockpile at truck-a-minute speed. Loads snow up to 20 yds. per minute, other materials up to 10 yds. per minute. Roads to 26 mph.

Adams Graders — Six models, 15,500 to 30,200 lbs.; 60, 80, 115, 123, 150, 190 hp. Standard heavy-duty models have 8 forward speeds to 26 mph, 4 reverse to 13 mph, and 3 optional creeper speeds. POWER-Flow 660 with torque converter, gives infinite speeds forward to 27.4 mph, reverse to 24.4 mph. 60 hp "220" has 9 speeds forward, with optional creeper gears . . . best in its class. Choice of GM or Cummins engines on 5 larger models. Snow Plow, Wing, V-type Scarifier, Power-shift Moldboard, Bulldozer, Rotary Snow Plow, and "Snow-Blo" attachment for wing also available for Adams graders.

Elegrader — Excavates, elevates dirt up conveyor for casting or loading. Attaches to Adams 440, 550, 610, 660 graders; fits Cat 12.

LeTourneau-Westinghouse also manufactures: Tractor-drawn scrapers, Power-Control-Units, Rooters, Sheepsfoot Rollers, Jib Cranes, and Tournarope (from ¼" to 1½" dia.).

(see next page)

Star Profit-makers . . . the result of 30 years of constant improvement

LeTourneau-Westinghouse Company — through 30 years of constant research and engineering — pioneered and introduced designs and features that have played a major role in contributing toward the progress of modern earthmoving methods and machines.

When LeTourneau-Westinghouse first introduced the 2-wheel rubber-tired prime-mover there were many who scoffed at the idea. But over the years this principle of 2-wheel prime-mover — with interchangeable trailing units — has demonstrated certain economies and advantages which now are the goal of many leading equipment manufacturers. As evidenced at the 1957 Road Show, in Chicago, the original "Tournapull" idea is here to stay.

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To provide you with dependable equipment . . . and the best possible customer service . . . your LeTourneau-Westinghouse Distributor has invested substantially in modern earthmoving tools and service facilities. His shop is well-equipped . . . his stock is complete . . . his staff is factory-trained to help you keep your equipment operating at top efficiency. So . . . get acquainted with your L-W Distributor . . . whether your need is *now*, or in the future. You will be welcome.

LeTourneau-Westinghouse — pioneer in earthmoving equipment

In addition to the rubber-tired 2-wheel prime-mover, LeTourneau-Westinghouse was *first* to bring you such money-making features as:

FIRST scraper to dig, carry and spread.

FIRST scraper with positive load ejection to spread stickiest materials.

FIRST with all-welded steel construction of box-beam design, for less dead weight, maximum pay-yards per pound of scraper weight.

FIRST electric-welded road graders.

FIRST to promote giant rubber tires for extra load-carrying capacity and greater flotation.

FIRST to give you a scraper over 12 yards capacity, for bigger pay yardage from your tractor horsepower.

FIRST heavy-duty tractor with rubber tires, for high-speed and mobility.

FIRST road grader with leaning wheels.

These are just a few of the many L-W developments that have helped speed dirtmoving and give you lowest-net-cost-per-yard.

Manufacturer of Tournapulls*, Tournatractors*, Twin C** Tractors, SwitchTractors**, SwitchMobiles**, Rear-Dump and Bottom-Dump Haulers, Flat-Bed Haulers, Logging Arches and Winches, Cranes, Full-pak** Scrapers, Tractor-Drawn Scrapers, Rooters, Sheepsfoot Rollers, Angledozers*, Bulldozers, Snow Plows, Adams** Motor Graders and TraveLoaders and related attachments, Power Control Units, Tournarope* and Tournaweld*.

*Trademark Reg. U.S. Pat. Off.
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The Engineering Journal Photo

Scottish concrete gravity dam where . . .

Dovetailed Precast Panels Are Dam Formwork

Precast concrete panels featuring a dovetail design were used as the formwork for Cluanie Dam, a large gravity structure in Scotland. The backs of the panels were designed so that a tail at the bottom of one fits into the pocket of the one previously placed, forming an enclosure the depth of the next concrete lift.

Including the projecting tail, the panels run 8 ft in height with the tail accounting for 2 ft. The front, or dam face, side measures 5x5ft. The tapered toe and pocket portion is set in about 9 in. from the panel edges and adds 1 ft 2 in. to the 7 in. thickness of the panel proper.

The panels were cast in molds assembled on a vibrating table. Upstream panels each weigh 4,480 lb and contraction joint panels, 3,360 lb. For the downstream panels, which each weigh 7,280 lb, the tails were omitted. Peak output in the casting yard was in excess of 500 panels a week. Molds were stripped after five hours and panels cured for 7 days, with the number of rejects small.

• **Placing the panels**—A small mobile crane resting on the previous lift of concrete was used to place the panels.

First a layer of mortar was placed in a groove in the top edge of the lower panel. Precast concrete cylinders, called joggles, were set in two other grooves in the top of the panel. The upper panel was then lowered so that corresponding grooves fitted over the joggles. This permitted a limited amount of pivotal movement for aligning the face of the panels.

The tail of the upper panel now fitted loosely in the pocket of the lower panel. Concrete wedges were inserted around the toe and, with the panel set true, the pocket was filled with grout to make a solid joint. Concrete also was rammed down a channel through the tail to fill the void behind it.

Reinforcing steel was used only in the tails and around the pockets of the panels to strengthen against damage during handling and erection. The tailless downstream panels were propped up with precast concrete struts to hold them to their correct slope until concrete had been placed behind them.

Consulting engineer for Cluanie was Sir William Halcrow & Partners, of London. Contractor was Mitchell Construction Co., of London, and owner of the dam is North of Scotland Hydro-Electric Board. Patent specification for the panel is held by Mitchell Eng., Ltd., of London, and J. W. Moore of Stamford.

The material for this article was published in the January, 1957, issue of the Engineering Institute of Canada's ENGINEERING JOURNAL, which featured a story of the panels by J. S. Ellis of the Department of Engineering, University of Cambridge, England.

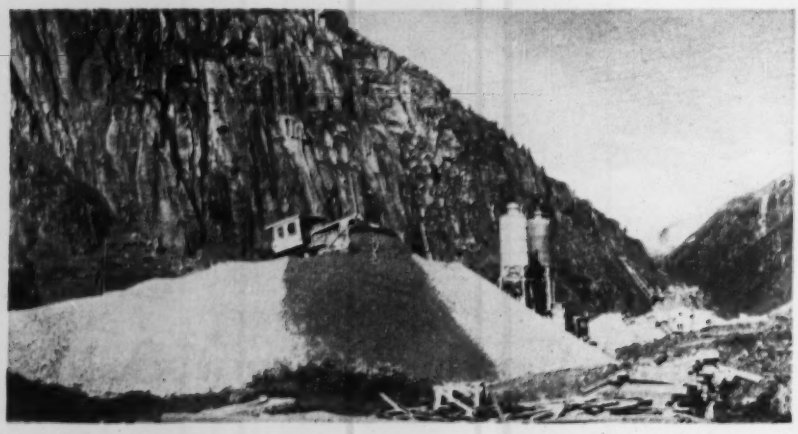
(Intl. continued on page 82)

**Trademark G-1425-G

Swiss Dam Taps Separate Streams for Power

Caterpillar Tractor Co. Photos

ROCK AND GRAVEL are bulldozed from streambed for use in Switzerland's Goschenenalp Dam, an earthfill structure 440 ft high. Dam emplacement is at left background.



STOCKPILE of sand and gravel for dam's core sits beneath rocky cliffs of the Alps.

DOWN TO BEDROCK—Shovels excavate alluvial material to enable foundation of impervious core to rest on solid rock.

Another step toward Switzerland's goal of a 15 billion kwh power output by 1960 is being taken as Goschenenalp Dam goes under construction high in the Alps. The $20 million project—one of 17 new hydroelectric stations under construction in Switzerland—is planned to have a power rating of 126,000 kw when completed.

The 440 ft high, 1,780 ft long earthfill structure will dam the Goschenenalptal River and also store water from two other streams in the area—the Voralpertal and Urserental Rivers. Project site is near Andermatt, about 25 miles southeast of Lucerne.

Water from the supplementing rivers will flow into the dam's reservoir through tunnels piercing the mountains—the one from the Voralpertal to be 2¼ mi long and the Urserental 6¼ mi. Useful controlled storage will total 60,000 acre-ft of water.

• **Impervious core**—A temporary diversion tunnel tapping a cofferdam across the Goschenenalptal River moves water past the work site.

Total volume of fill for Goschenenalp will be 9.8 million cu yd. The dam is being built with a rockfill slope both upstream and down on an impervious core. The core is of sand and gravel mixture (borrowed from the alluvial soils in the valley) to which clay has been added.

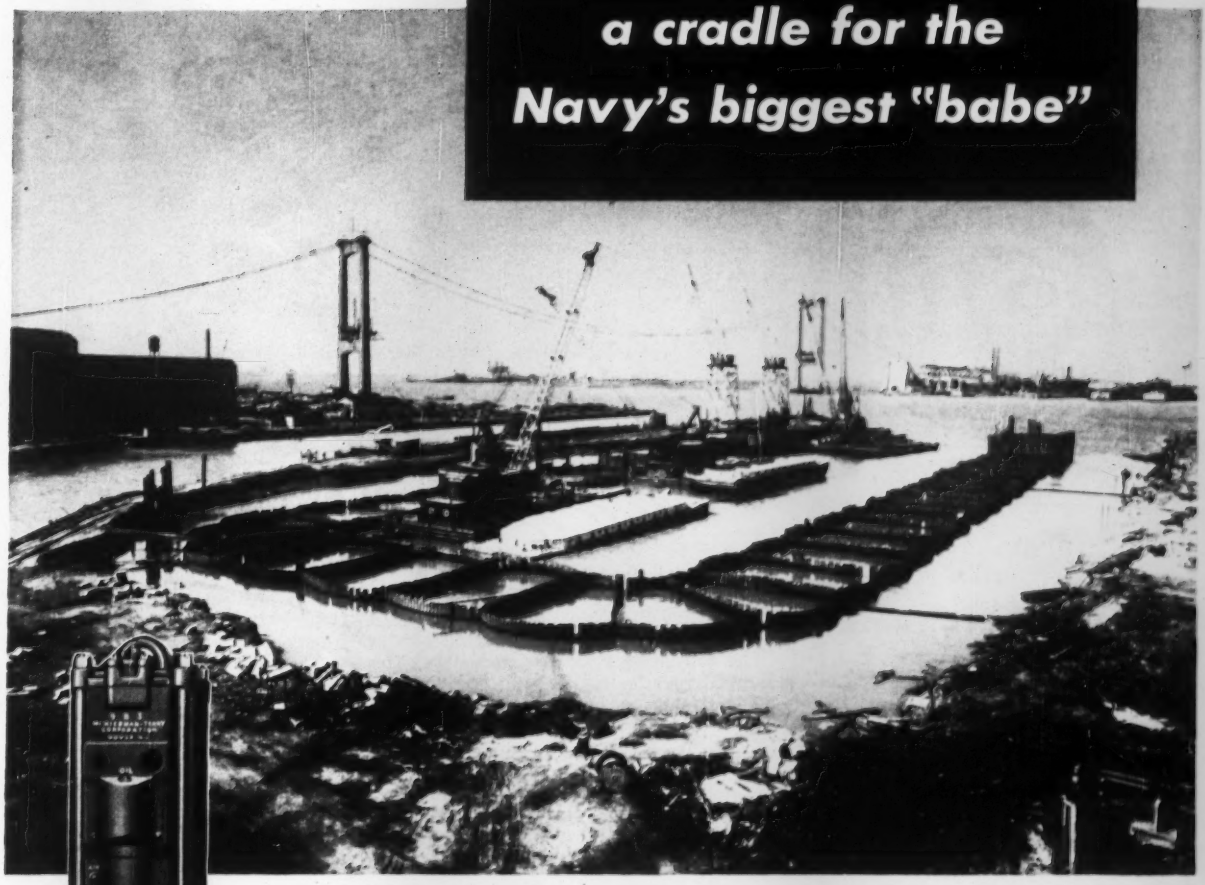
On either side of the core, filter screens made of sand and larger gravel are being put down. Sand, gravel and boulders, borrowed from rocky debris in the area, make up the embankment shell.

Working season at the site, 5,400 ft above sea level, is short—150 to 170 days. And the 80 days being allowed for core placing would have been still shorter—50 days—had not the owner of the dam, Electro-Watt, designed a roof to be built over a part of the core, under which machines can work. [Electro-Watt also is building 780 ft high concrete Mauvoisin Dam, highest arch dam to be tried (ENR May 24, 1956, p. 34).]

Water from the reservoir will enter an intake to be set 1,148 ft upstream from the dam. From there the flow will be through a 22,474 ft long, 10 ft dia tunnel to a surge tank. Water then will go into a two-section, steel-lined pressure shaft—the first section 2,992 ft long with an 80% slope, and the second 380 ft long with a 1.6% slope.

The underground power plant at Goschenen is to be equipped with four

McKIERNAN-TERRY PILE HAMMERS *help to build a cradle for the Navy's biggest "babe"*



McKiernan-Terry 983 Double-Acting Pile Hammer

It required 66 elliptical interlocking steel cells, each 36 ft x 54 ft, and 9 circular cofferdams to block out and seal off the graving dock in which the 60,000-ton Superaircraft Carrier Kitty Hawk is to be built by New York Shipbuilding Corp.

The dock is located on the Delaware River at Camden, N. J., and is the largest privately owned in the country. The contractor, Merritt-Chapman & Scott, used McKiernan-Terry Pile Hammers, operated from four floating derricks, to assure speedy work in driving the 8,400 heavy steel sheeting for the cells and cofferdams.

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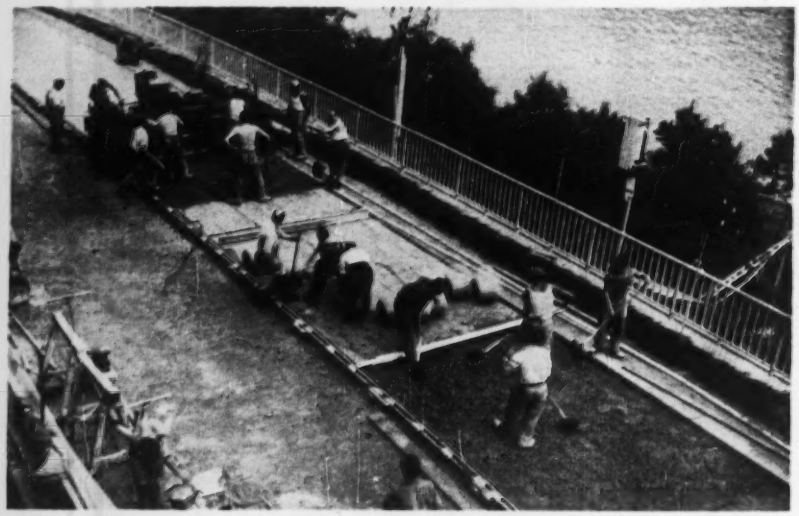
generator units, each driven by a vertical-shaft, Pelton-type turbine. Excess water will not be wasted but directed further downstream to the Wassen power plant, which is already in operation.

The Goschenenalp project is being worked on by a group of Swiss contractors Schafir & Mugglin AG.; A.G. Conrad Zschokke; AG. H. Hatt-Haller, E. Baumann AG., Bless & Co.; Locher & Cie., Losinger & Co. AG.



Swiss Eye Snow Removal by Electricity

Swiss highway engineers are viewing with great optimism the results of controlled experiments in the removal of snow from bridges by means of electrical heating of the pavement slabs.

The test bridges are five newly-built prestressed concrete structures at Murg on the Walensee (a lake in Canton St. Gall in northeastern Switzerland). Four of the structures average more than 8,000 sq ft of roadway each, while the fifth has only 3,900 sq ft.

The test structures were selected because of their ideal location for test purposes: They are so located as to be out of direct sunlight during the winter months, thus eliminating the need of compensating for the effect of the sun's rays. Furthermore, the structures are all approximately 1,440 ft above sea level in an area where snow falls from 27 to 44 days per season and where there is frost on more than 130 days.

The heating unit consists of a fine, uninsulated galvanized wire mesh imbeded in the wearing surface of the deck slab at a depth of 1½ in. This wire is connected to the power supply through a transformer which cuts the potential to a safe 25 volts, and heats the mesh only to 50° F. The input supply is controlled by a three-stage switch which permitted a wattage consumption for each square foot of heated surface of 3.35 w in stage one, 8.65 w in stage two or 14.30 w in stage three.

In order to prevent structural damage—because of excessive temperature variations within the slab—electrical thermal recording devices were placed at strategic points within the concrete, and these are watched closely during all experiments. At no time during the tests have temperature variations between the upper and lower surfaces been recorded at greater than 7.0° F., and the average variation was only 4.0°F., even with the current at stage three (14.30 watts per sq ft).

One interesting, although not particularly surprising, result of the tests was proof that by application at the proper time, phase two with 8.65 per sq ft. of surface could accomplish more than phase three with 14.30 w per sq ft. In the case in question, with a temperature of 17.6° F and some wind, phase three had almost no effect on an already fallen snow. However the lesser wattage of phase two, when applied initially a short time before the snowfall, not only melted the snow as it fell, but succeeded in evaporating the resulting water so as to leave the roadway dry.

In the opinion of the Cantonal Road Inspectorship which is conducting the tests, electrical heating of bridges for snow removal is feasible and economical provided the heating is begun shortly before a snowfall occurs.

(*Int'l continued on page 86*)

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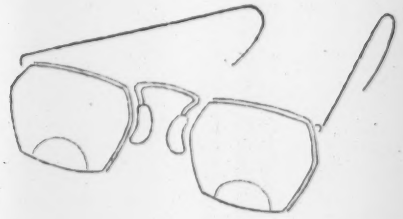

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Funnel-Shaped Tank Jacked to Top of Tower

A mushroom-like concrete water tower has just been completed in the central Swedish city of Orebro. The unconventional design gave birth to an unconventional method of construction.

The funnel-shaped water basin was built on the ground and was lifted, as the central column rose, to a height of 100 ft. The job was accomplished by 32 hydraulic jacks, specially constructed for this application.

The concrete basin, which weighs 3,200 tons empty (12,000 tons filled), is made of prestressed concrete. The concrete is reinforced with 208 cables, each consisting of twelve ¼ in. dia strands having a resistance to rupture of 213,000 psi. The exterior diameter of the funnel at its widest part is 145 ft; its water depth at the center is 45 ft.

The hoisting of the water tank proceeded in 4 in. lifts. After each such lift, a light metal disk was inserted below the hydraulic jack. Each group of three disk was replaced by a cylinder of reinforced concrete, subsequently built into the supporting column. This column, which has a diameter of 34 ft, was built by means of slip forms. Two rows of cylinders were completed per day, and the entire lifting job required two and a half months.

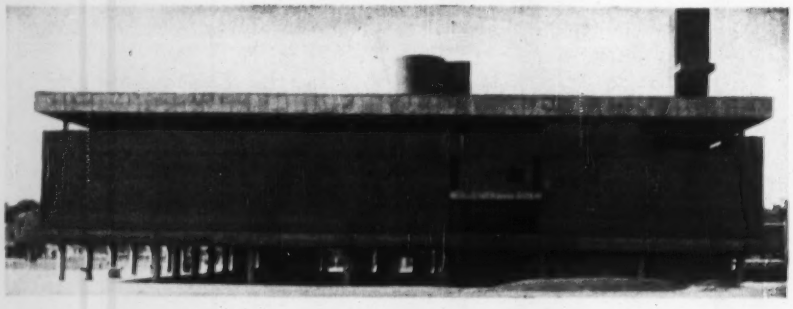
The jacks had a lifting capacity of 100 tons each, at a working pressure of 5,700 psi. A manometer, reversing valve and cut-off valves for feed and return connections, as well as locking nuts, formed part of the safety arrangements.

Boost In Salaries Sought For Australian Engineers

Concern over engineers' salaries is growing in Australia.

The country's Association of Professional Engineers, which states it has a membership of 4,000 of 15,000 potential members, is seeking to have salaries raised about $1,500 a year for beginning and experienced qualified engineers. The association holds that the minimum salary for qualified and chartered engineers, the two top categories, should be $4,620 and $6,160, respectively.

The association also is finishing up a national survey of the profession.



Museum for Indian Center Nearly Complete

The first building of the $1 million cultural center being built in Ahmedabad, India, is nearing completion. The building, a museum, is of reinforced concrete construction. It is supported above the ground on reinforced concrete stilts, a trade mark of it's designer, the French architect Le Corbusier.

The center is designed as a composite of national and international thought. It will include a section on history, archeology and anthropology, an art gallery, library, workshop and theater.

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Because joints in concrete pavement cause bumps and require maintenance, researchers at Lehigh University are making studies of two highway jobs in Pennsylvania in . . .

THE NINE INCH SLAB is in place. Department of Highways inspectors check to see that the steel mat has remained at the mid-point of the slab.

A Look at Jointless Concrete Pavement

PAVING MACHINE drops a load of concrete for the second 4½ in. course. About 70 ft of base concrete was laid before the reinforcing mats were placed. The strike-off machine then returned to place the final course of concrete.

Interest has been revived in continuously reinforced concrete which seems to offer not only smooth riding, but also lower maintenance cost.

In order to place the design of such a road on a sound engineering basis, Lehigh University has undertaken two research projects for service testing experimental pavements of this type. The projects are under the sponsorship of the American Iron and Steel Institute, the Pennsylvania Department of Highways, and the Bureau of Public Roads.

The design of now-conventional reinforced highway slabs, with load-transfer joints every 30 to 100 ft, is based on the assumption that minor thermal cracking will be mobilized at the load-transfer joints. This construction, though successful in previous experience, is not the best condition.

For years, engineers have given thought to the design and construction of reinforced concrete pavements. Their principle has been that if cracks that form are held tightly together, there is no reason why cracking cannot be permitted to occur at any natural interval. (The mere existence of cracks does no damage—the damage takes place when the cracks become widened so as to permit pavement pumping and extreme strains in the steel due to vehicle loads.)

• **Answer found?**—Continuously reinforced concrete pavement may be the answer if the reinforcement is of a special size so as to hold the cracks tightly. The emphasis would thus be placed on the relation between the strain in the steel and the width of crack opening.

Such pavements have been constructed as experimental projects in New Jersey, California, Illinois, Indiana, Texas and now in Pennsylvania.

Fundamentally, the behavior of any continuously reinforced concrete pavement is dependent on the shrinkage of the concrete, temperature-caused expansion and contraction, and strains induced by imposed external wheel loads.

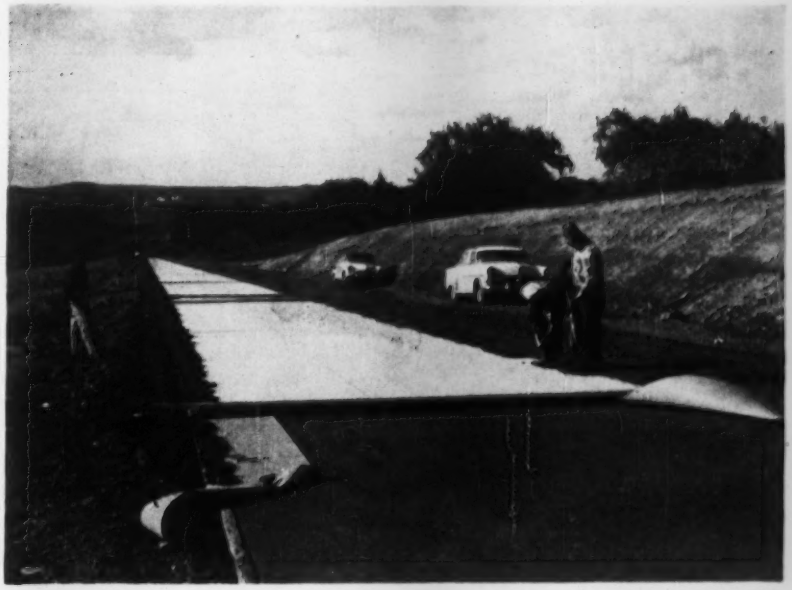
The behavior of concrete initiates internal capillary forces. These attempt to contract the concrete by what is generally referred to as shrinkage. In reinforced pavements, the restraints offered by the bonding of the concrete to the steel and the subgrade will establish net tensile forces. When this force reaches the rupture strength of the concrete, a shrinkage crack will form.

The temperature mechanism of cracking, for continuously reinforced pavements, is similar. For a given temperature drop, there will be less total displacement than for a slab unrestrained by a subgrade.

• **Theory**—The amount of horizontal movement will depend upon the restraining horizontal shear stresses, mobilized between the subgrade and pavement. The effect within the pavement will be a net tensile force, restraining movement. The magnitude of these forces, at any point, will depend on the temperature drop and the resultant net movement. The distribution of forces will start from zero at the free end, and build up to full restraint at some distance from the free end.

At a point, close to the free end, the tensile strength of the concrete will be reached, and the slab will crack. Once the first crack develops, the steel will form a bonded dowel at the crack and will maintain the continuity of the pavement.

Under this conception of temperature deformations only, the restraint stresses will build up to a point of complete restraint throughout the central portions of the slab. Subsequently, in theory, the frequency of the initial temperature cracking will increase towards the center section of the pavement. In the subsequent temperature cycles, the inelastic deformation of the subgrade will play a considerable part in the partially restrained portion.



CURING PAPER is placed on the freshly finished concrete surface, as final step in paving operation.

At the end of the initial temperature drop, the slab, except for the free ends will be in a state of tension. When the temperature reverses, there will be a tendency for the cracks to close as the tensile strains are relieved.

The closing of the cracks depends on the ability of the pavement, in the partially restrained areas, to move over the subgrade. Since the movement is not completely reversible, the pavement will not, for the same temperature change, return to its unrestrained condition. Thus residual tension strains will be established, and these strains will become cumulative near the ends where relatively large movements can occur. They will be almost zero in the central portions of the slab where there is little or no movement.

After several cycles cause the accumulation of residual strains, the end portions of the slab will be strained and will crack. Thus a high frequency of cracking will occur at some distance from the free end. This process will continue until the subgrade soil is so strain-conditioned that it reaches a state of force-deformation reversibility. After several years, excluding load efforts on the pavement, the total range of temperature variations will be achieved, and the crack pattern will stabilize.

It is certain that the mechanisms of capillary shrinkage and temperature expansion and contraction are in operation to varying degrees at all times. Initially, the shrinkage concept is probably the predominant one, while later the temperature mechanism will major. The shrinkage cracks set the pattern of future behavior.

The effects of wheel loads on a continuously reinforced pavement categorized the behavior as semi-flexible. Almost complete interaction between the bonded cracked slabs occurs, provided the aggregate interlock is not broken. In addition, there will be a tendency for the pavement to warp under the influence of unequal temperature distributions.

• **Current studies**—The study at Lehigh will be under actual highway service conditions. Assuming these mechanisms to be close to the actual behavior of pavement, certain measurements will be made to study the behavior patterns. In the first instance, it will be necessary to measure behavior at a crack to determine the crack width opening and the strains in the steel. Actually, the strains in the steel are only of importance when they are of sufficient magnitude to permit a crack to open to objectional widths. The basic study being made is to determine the crack width and steel strain as a function of the thermal oscillations.

• **York project**—The first study to be made of continuous pavement in Pennsylvania was made on Route 111, six miles north of York, a part of the main north-south highway linking Harrisburg with Baltimore, Maryland. This highway is a dual-lane road with two 12 ft lanes in each direction.

The total length of the section laid

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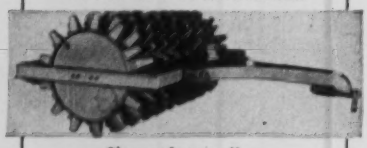

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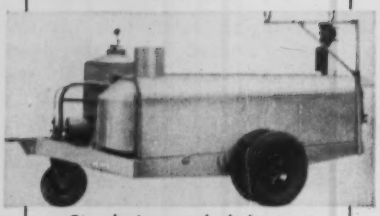

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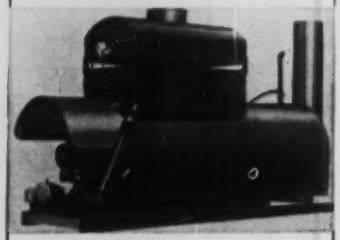

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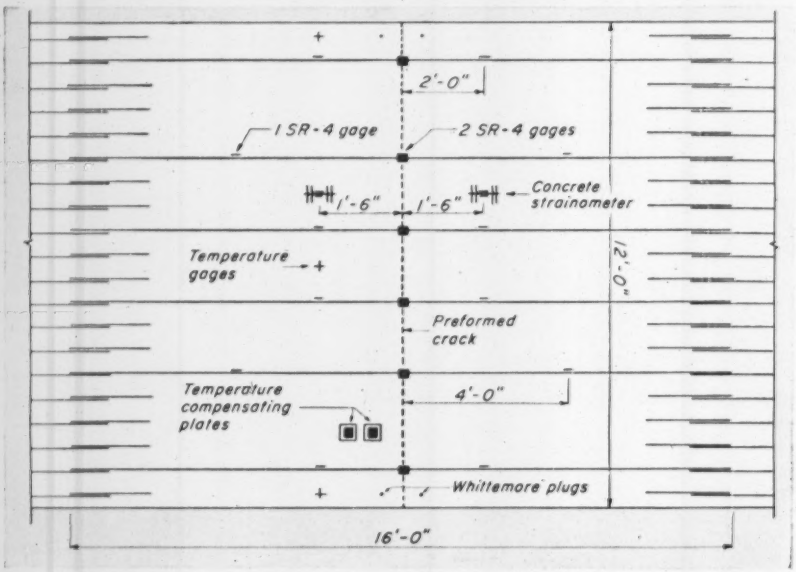
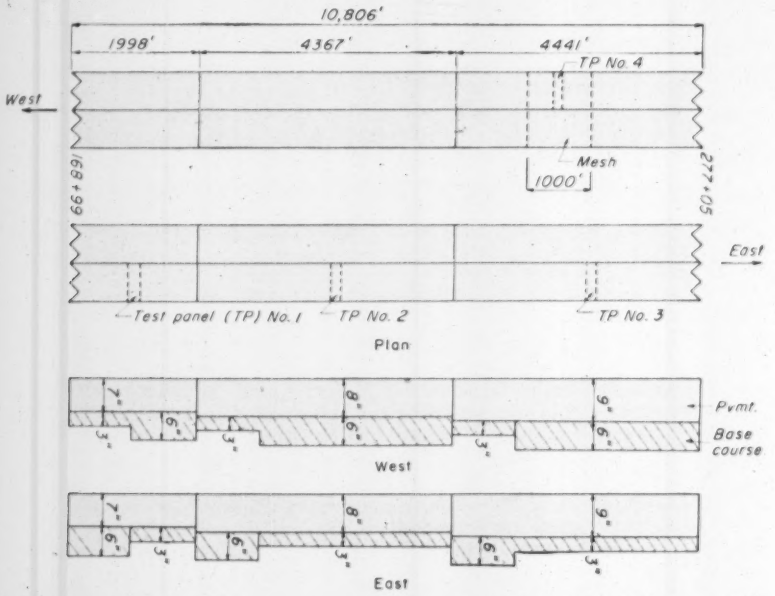


YORK PROJECT test section instrumentation plan. Corrugated metal strip simulates natural crack.



HAMBURG PROJECT general plan. Sub-base courses will be watched closely; variations in thickness may provide important design information.

by the H. J. Williams Company, York, Pa., is 11,559 ft with a 9 in. thick pavement resting on a 6 in. granular base course.

To give strength, special deformed reinforcing mats were used providing 0.48% steel (longitudinal reinforcement. The mats—16 ft long and 6 ft 2 in. wide—weigh 185 lb per 100 sq ft. They were laid at mid-point of the slab. In placing the mats on top of the first 4½ in. course of concrete, mats were overlapped a foot at each end and eight inches along the sides. The bar mats, fabricated by Bethlehem Steel Company, consist of seven No. 3 transverse bars and ten No. 5 longitudinal bars. Where longitudinal and transverse bars cross, clips were used to bind them. Clips were used to join adjacent mats.

The south end of the continuously reinforced concrete pavement joins the standard pavement by means of a finger-type bridge expansion joint. The north end of the experimental pavement

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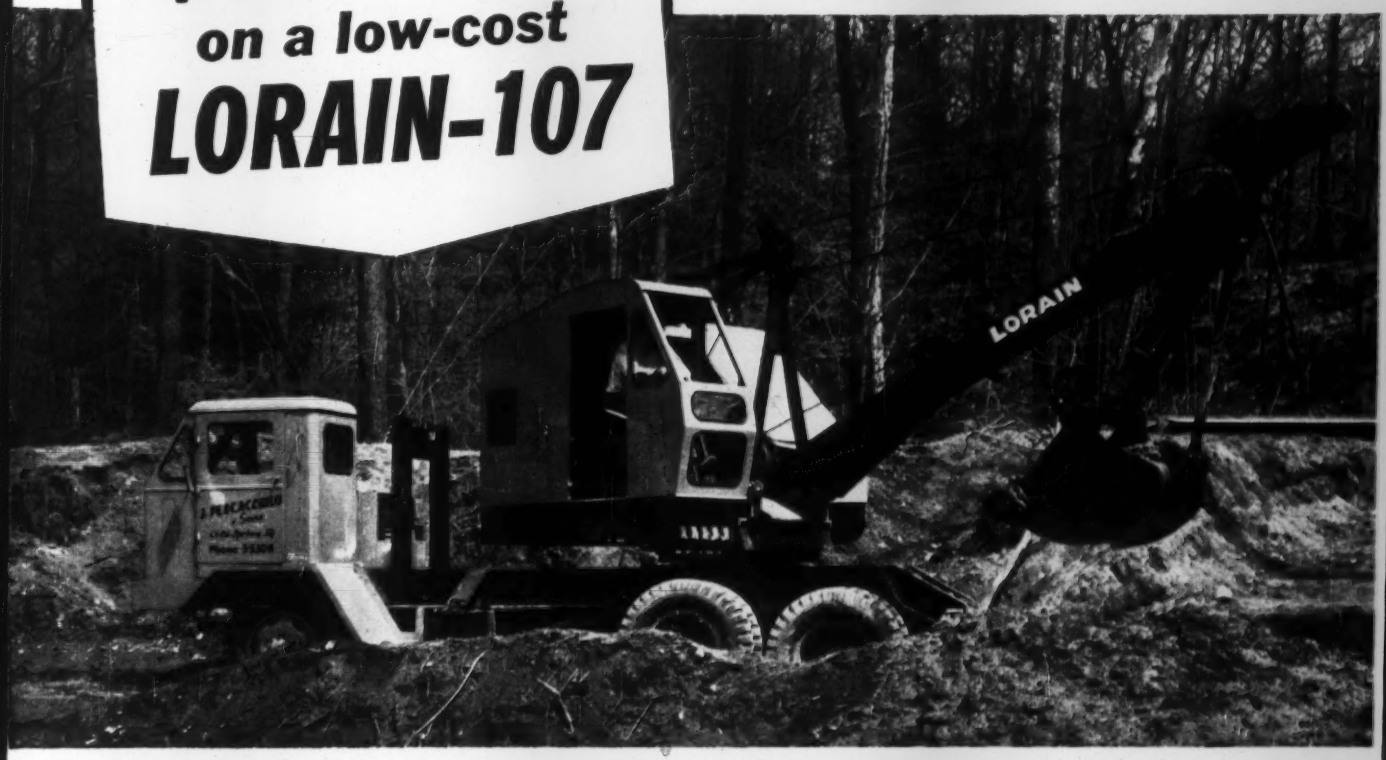

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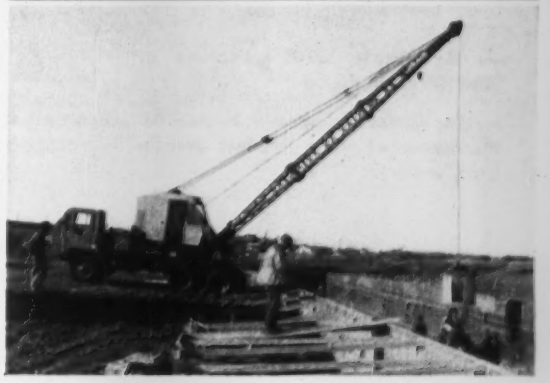

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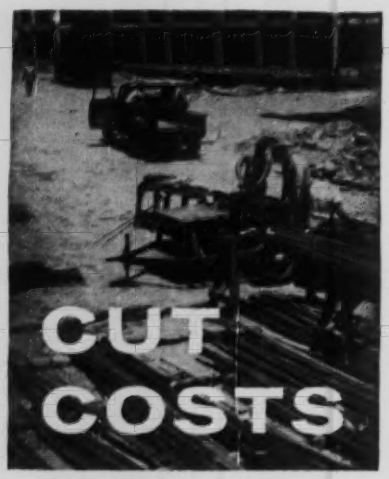

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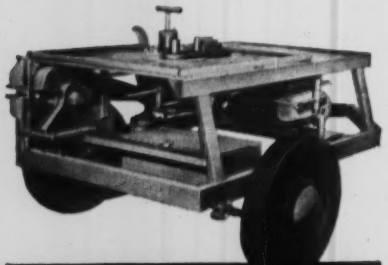

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Midland Products Co.,
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joins the standard pavement by means of four standard expansion joints, spaced 61.5 ft apart in the standard side.

The juncture between lanes was made by use of a keyed joint and ½ in. round hook bolts, spaced five feet on centers.

• **Subsurface soil conditions**—The subgrade construction was in accordance with the usual procedures of the Pennsylvania Department of Highways. Fills were placed in eight inch loose lifts, and compacted with a roller until satisfactory compaction was achieved. Proper compaction was indicated by non-movement of the soil beneath the roller. In general, compaction was achieved by use of a sheepsfoot roller, while the base course was compacted by a flat wheel roller.

A record of the subgrade soil conditions was made with regard to soil size and plasticity characteristics, from samples taken at the finished grade. Density determinations were also made.

In terms of the AASHO soil classification system, the general run of the subgrade soils was in the group classification of A-4, with a maximum group index of 8. There were a few samples of group classification A-2-4, and of A-6. The liquid limit moisture content for most of the subgrade soils was between 23 and 28, with a few between 28 and 35. The Plasticity Index for the majority of the soils was under 10, with a few exceptions, in which case the PI was limited to a maximum of 18. The percent finer than the No. 200 sieve varied from 27 to 84%, with the majority of the samples in the vicinity of 50% passing.

In terms of rating the soils as to potential performance as a highway subgrade, the high percentage of silty and clay soils would indicate that the potentialities for frost-heaving would be moderate to objectionable for groundwater conditions within six feet of the pavement. The subsurface drainage of these soils would be poor, and they would exhibit a potential capillary rise of from 7 to 20 ft. The overall expected maximum dry densities would range from 110 to 120 lb per cu ft. It is to be expected that the subgrade soil would have normal capillary saturation of about 100% of optimum moisture, which ranges from 10 to 14% by weight. These soils are susceptible to pumping. The performance ratings indicate that the permanence of the compacted fill, in terms of its relative supporting ability, is fair to poor. These soils are subject to considerable loss of support due to climatic variations.

The measured in-place densities varied from 94 to 105% of optimum Proctor Density. The densities were taken from an exposed surface that had been subjected to several weeks of heavy traffic, and the strengthening effect of capillary evaporation.

Under local climatic conditions the free-draining six inch compacted base course should alleviate most of the potential frost-heaving, pumping, and drainage conditions. In addition, the base course will act as a load distributing mechanism to spread the traffic load over the subgrade, and thus tend to alleviate the potential loss of support.

In order to determine the fluctuations of the groundwater level, seven piezometers were placed in key locations.

• **Construction materials and procedure**—The nine-inch experimental pavement was constructed as a portion of the regular contract for the entire highway section. The contract specifications and plans call for the conventional 10 in. pavement to be installed at either end of the experimental pavement. The southern section of the standard pavement was installed in the fall of 1956. The 10 in. pavement on the northern end is currently being installed in anticipation of opening the highway to traffic by July.

Air-entraining cement was used for a design mix of 1:1.79:3.5, and five gallons of water per sack of cement. Entrained air, on a volumetric measure, varied from 2.2 to 3.3%. The slump varied from 1⅜ in. to 2⅝ in. The design slump was 1¾ in.

Structural properties of the concrete were determined by the Highway Department in the course of their routine testing. The tests performed were on plain concrete beams—one being poured on each day of paving—and standard concrete cylinders taken sporadically along the highway.

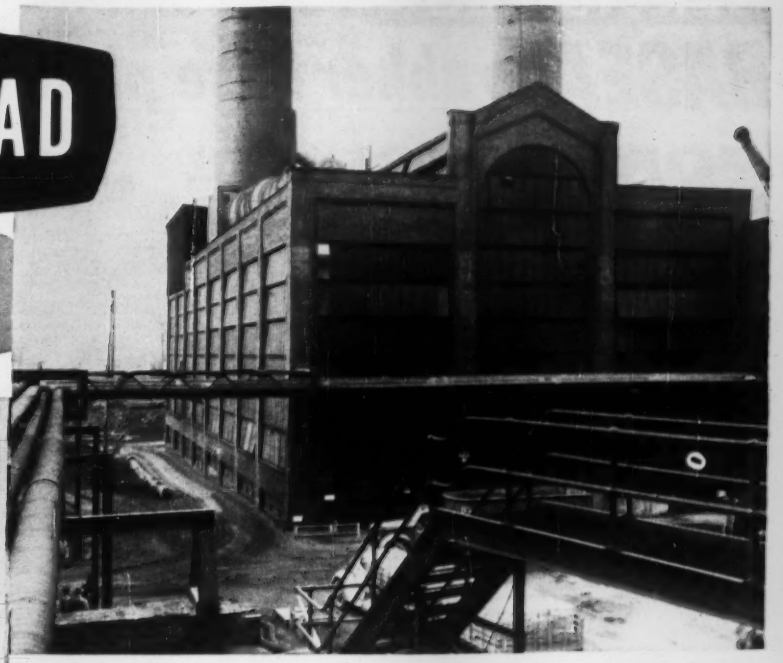
The reinforcing steel conformed to ASTM specifications. Based on mill reports, the steel yield point had a range from 60,000 to 90,400 psi, with an average of 77,800 psi. The tensile strength ranged between 92,000 and 134,700 psi, and averaged 118,500 psi. The elongation in an eight inch gage length varied from 10 to 14%, with an average of 11.3%. The construction followed the usual procedures used in Pennsylvania, except for the section in the gaged area.

The concrete from the mixer was dropped in front of a screw-type mechanical spreader. The concrete was struck off at 4½ in. and was vibrated directly behind the spreader, along the edges of the lane. The reinforcing steel was placed immediately behind—

OVERHEAD

OR

underground



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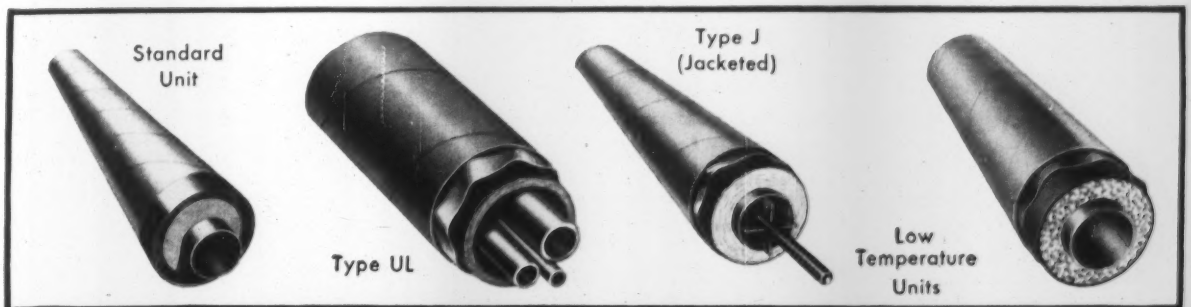

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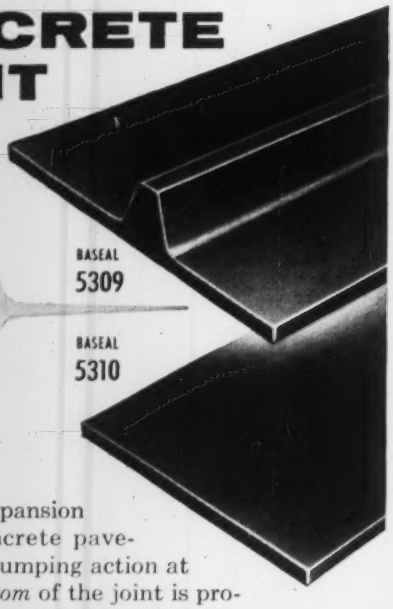
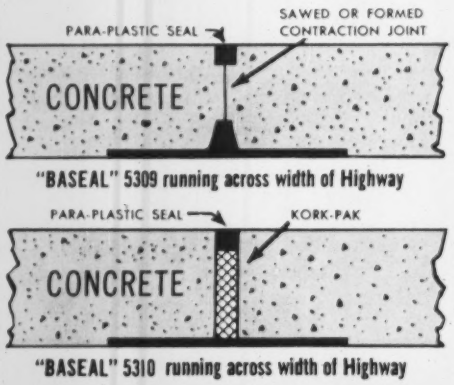


For maximum protection of expansion and contraction joints in concrete pavement, and the elimination of pumping action at joint intervals, be sure the *bottom* of the joint is protected against water seepage and the infiltration of foreign materials. Specify Servicised "BASEAL"—a resilient rubber base plate for expansion and contraction joints—made in two types, specifically designed for optimum performance and joint protection. "BASEAL" provides long-time protection because it is an extremely stable rubber compound, resistant to deterioration caused by fungus growth, etc.

Installation is simple. "BASEAL" is merely placed over the compacted pavement base prior to paving. Due to its resilient characteristics, the material will conform to the terrain after concrete is poured.

"BASEAL" is available in continuous lengths of 26 feet. Standard width is 6 inches.

Drawings at right show Servicised "BASEAL" in place in expansion and contraction joints.



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mats were lapped longitudinally a full 12 in. to provide continuity of steel. After placing several lengths of reinforcement, the spreader moved back and completed the remaining 4½ in. of pavement. The finishing equipment then moved behind the spreader. The pavement was cured a minimum of 72 hours after pouring by using curing paper.

At the test section where the strain and temperature instrumentation was installed, and instrumented bar-mat was placed on chairs. The first lift of concrete was placed up to the instrument mat. Concrete was omitted over this area, but placed several mat lengths ahead of the test area. The regular steel was then placed, working back from the test rods a distance of 75 ft.

After the steel was placed, both behind and in front of the test area, the second lift was completed. When the spreader reached the test area, a full nine inches of concrete was placed carefully to avoid disturbing the instrumentation. No vibration was permitted in this area, but the concrete was carefully rodded to avoid honeycombing.

• **Test methods**—In the York project an instrumented test section was installed where direct measurements of strains in the steel and concrete were made.

The purpose of the test panel was to create a crack, in as natural a manner as possible and to instrument the steel at (and in the vicinity) of the crack. In addition, they desired to measure the crack opening; the temperature distribution in the concrete, and the strains in the concrete itself. These studies will be supplemented by an overall crack-frequency study and a road-roughness study, to be made by others.

A strip of corrugated sheet metal, four inches high, was installed to cause a controlled crack. Corrugated sheets were used as a means of simulating, as closely as possible, the effects of a jagged crack, known as aggregate interlock.

The basic instrumentation consisted of plastic SR-4 strain gages mounted on the reinforcing steel. Out of 20 bars, six were gaged. The bars at the crack were double-gaged to average out the bending strains, while the gages away from the crack were placed on the side of the bar for the same purpose. The gages away from the crack were placed at distances of 2 ft and 4 ft from the crack, as a means of measuring the bond development. In order to break the bond at the crack, all non-instrumented bars were wrapped with

RADIO helps build roads, level rough country, fight fires in the California mountains

Archibald's two-way radio-equipped supervisory vehicles, and special units such as the roving greasing truck (above), coordinate as many as 12 widely separated projects with the San Carlos head office. Radio keeps all units under constant supervision, saves time, money.

J. O. Archibald Co., San Carlos General Engineering Contractor Uses G-E 2-Way Radio . . . Keeps Equipment Working A Dozen Jobs At One Time.

ORDERS from the head office of the J. O. Archibald Company are dispatched to supervisors on the job by two-way radio. Company operations, sometimes widely separated, cover the San Francisco peninsula area and surrounding mountain districts. Yet all projects are under radio direction—through two-way radio equipped supervisory vehicles.

Archibald operates under private and government contracts for road building, pipeline installation, and earth moving projects of all kinds. When needed, company equipment helps fight fires threatening vital lumber lands.

"Radio Has Paid For Itself Many Times . . ."

"Our G-E radio has paid for itself many times over", say Archibald officials. "It saves us time, is convenient, speeds parts and men to projects, permits prompt response to emergency calls." The company reports excellent coverage with low band equipment—a 60 mile average from base to car, at times up to 60 miles car to car. A remote relay transmitter atop a mountain four miles from the base station helps overcome terrain interference.

Progress Line Offers New Advantages

The new G-E Progress Line of two way radio saves money on maintenance through faster servicing, protects from obsolescence because chassis are interchangeable. Changes in frequency, power, type of reception are made quickly at a minimum cost. See your local G-E Communications Counselor for full details. Or, write to: *General Electric Company, Communication Equipment, Section* C2757-16, *Electronics Park, Syracuse, New York.*

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High altitudes, narrow benches severely test this Michigan, yet every day it loads

400 tons of rock weighing 5,400 lbs per cubic yard

Up in the scenic Sapphire Mountains of southwestern Montana, Cummings-Roberts Company has one of the toughest rock-loading jobs you could find anywhere.

Part of the time, they blast and load coarse mountain-top granite . . . summer and early fall, they load fluorspar. No one needs to detail what a severe test the heavy, rough granite overburden gives to *any* loader. Fluorspar, however, is even worse. A heavy rock mineral, it weighs 5,400 pounds per cubic yard—over 850 lbs more per yard than in-bank granite (and 2,200 lbs more than pit-run gravel).

Proved by demonstration

Over the years, Cummings-Roberts has tried just about every kind of loader made. Last year to increase efficiency, their Michigan distributor, Miller Machinery Co., Missoula, suggested a Model 175A Michigan Tractor Shovel. "Frankly," Cummings-Roberts officials told them, "we don't believe *any* rubber-tire unit can load the stuff, much less do the work day in and day out. But we'll give it a try."

Result? John Taber, General Superintendent, wouldn't let them take the Michigan off the job.

Heaped loading assures proper blending

Today, the 133 hp 2¾ yard Michigan handles *all* loading of the super-heavy fluorspar. Production, with trucks on 600 ft one-way hauls to crushing mill, averages 400 tons per 7-hour day. The fluorspar, incidentally, varies considerably in grade from place to place through-

out the mine. It must be blended to give the grade desired for shipment . . . and this assignment goes to the Michigan, too. Its 27 mph mobility is a vital asset on this scattered loading; trucks never wait more than a few minutes for loading service.

Strips granite overburden — 500 tons per day!

In late autumn and sometimes in spring, the Michigan strips the granite overburden. Output averages *500 tons* per 7-hour day.

Downtime negligible

With all this rugged loading of super-heavy material, plus repeated back-and-forth maneuvering on narrow benches, plus continuous work at high 6,800 to 7,000 ft altitudes, the torque converter equipped Michigan has posted an excellent mechanical record. *To date, it has had only one minor breakdown!*

Also tows compressors, speeds other odd jobs

Operator Don Lindblom likes Michigan's powershift transmission, says its bucket action is the best he's ever worked with. "You can tip it back and fill it easily," he says. "I like the fact also that it takes only half-an-hour per day to refuel and lubricate." Foreman Waino Lindblom adds, "The Michigan has done a nice job for us! We particularly like its truck-like speed in moving from bench to bench." This mobility gives the Michigan some "spare time" to handle maintenance jobs scattered along 15 mi of mountain roads—cleaning rock rubble off benches so trucks and wagon drills can get through . . . hauling air compressors . . . digging culverts . . . even plowing snow.

Got a tougher job than this?

There *may* be a tougher materials-handling job than loading granite and fluorspar . . . but we're willing to bet a Michigan Tractor Shovel can do it faster, better, at lower cost than any other machine. To prove it, your Michigan Distributor will be glad to arrange a demonstration at *your* convenience. *You pick the jobs.*

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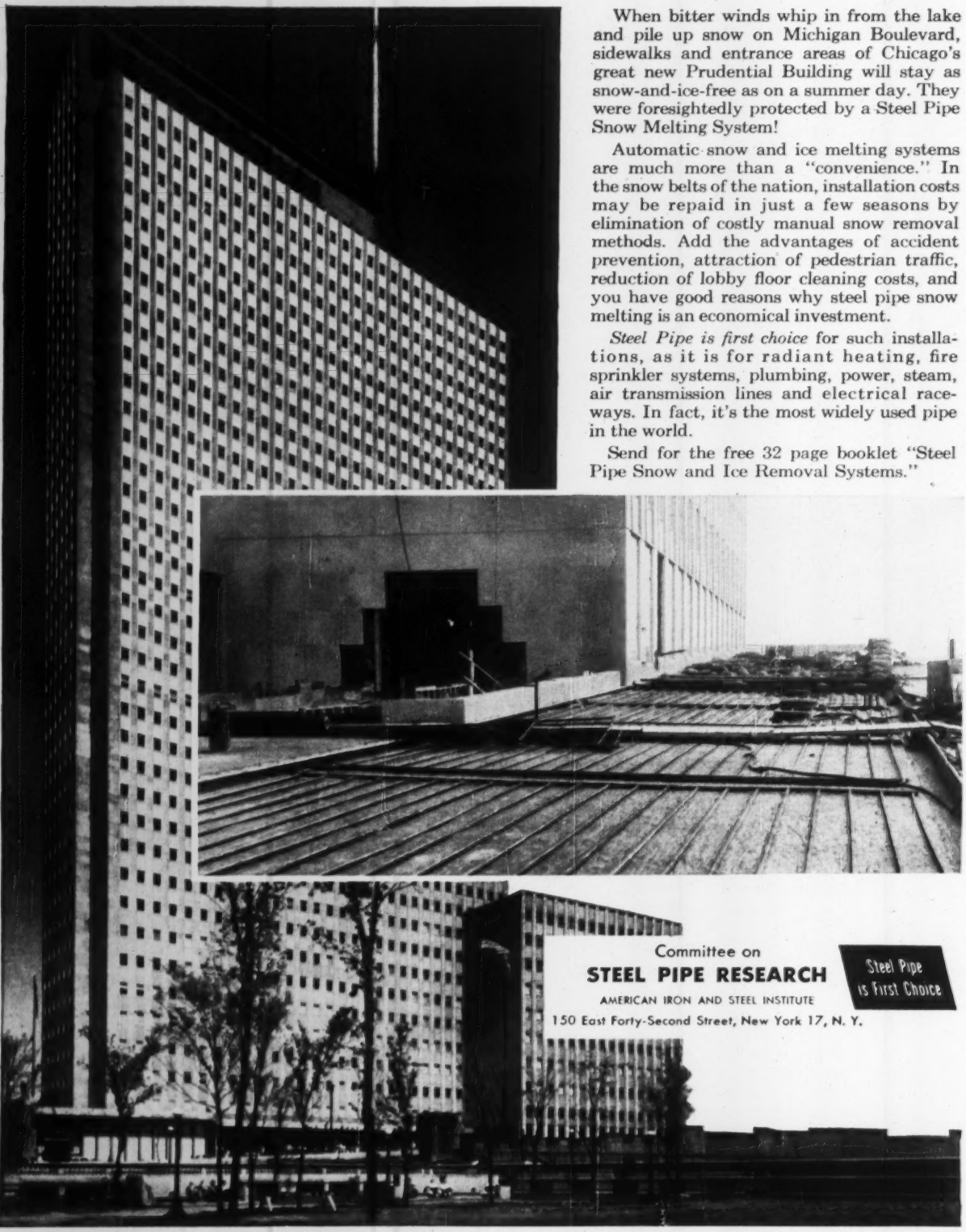

When bitter winds whip in from the lake and pile up snow on Michigan Boulevard, sidewalks and entrance areas of Chicago's great new Prudential Building will stay as snow-and-ice-free as on a summer day. They were foresightedly protected by a Steel Pipe Snow Melting System!

Automatic snow and ice melting systems are much more than a "convenience." In the snow belts of the nation, installation costs may be repaid in just a few seasons by elimination of costly manual snow removal methods. Add the advantages of accident prevention, attraction of pedestrian traffic, reduction of lobby floor cleaning costs, and you have good reasons why steel pipe snow melting is an economical investment.

Steel Pipe is first choice for such installations, as it is for radiant heating, fire sprinkler systems, plumbing, power, steam, air transmission lines and electrical raceways. In fact, it's the most widely used pipe in the world.

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rubber tape at the crack former. The length of the taped area was 2 in., the length in which the bond of the instrumented bars was broken.

The lead wires from the instruments were pulled through a flexible conduit which led underground, from the edge of the pavement to a control box at the edge of the right-of-way. Five temperature gages were installed in the pavement depth. At the center of the lane three gages were placed as follows: The bottom one, 1 in. into the base course; the second, 1 in. up from the bottom of the slab; and the third, 1 in. below the top of the pavement.

To determine the width of the crack, as related to strains in steel at the crack, two sets of Whittemore Gage plugs were used. Plugs were placed 10 in. apart spanning the expected cracks. One was placed near the shoulder and the other near the longitudinal joint.

In an attempt to determine the strains in the concrete itself, at a known distance away from the crack, a strainometer was developed at the Fritz Laboratory. The section was waterproofed. An additional waterproofing was applied with a coat of self-vulcanizing neoprene compound. To protect the gages from the concrete, abrasion resistant vinyl tape was wrapped over the area. The gaged area was also coated with Glyptal immediately prior to the placing of the concrete.

• **Hamburg project**—A second project in Pennsylvania was paved in April 1957 by James Julian Inc. on Route 22 near Hamburg.

In this project the pavement thickness was varied to include thicknesses of 7, 8 and 9 in. The base course included a 3 in. thick base course and a 6 in. base. Near the center of each section of pavement thickness change (and in the section containing wire mesh), an instrumented test panel with a preformed crack was established.

The reinforcing consists of No. 5 longitudinal and No. 3 transverse hard-grade steel bars. One thousand feet of pavement was reinforced with welded wire fabric, using ½ in. longitudinal wires. The steel percentage for the entire job is constant at approximately 0.5% of the pavement cross-sectional area.

To determine the magnitude and distribution of horizontal movement of the Hamburg pavement, surface plugs 100 ft apart were installed in the east bound lane, and the relative movement will be obtained by use of reference monuments off the road shoulder.

The study of warping effects of the pavement will consist of three phases. The first will determine the temper-

excavating granite overburden

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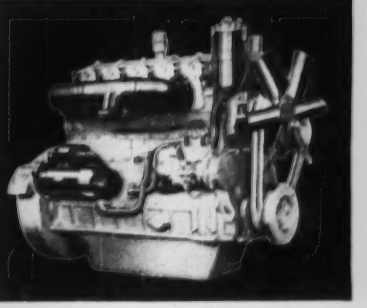
WAUKESHA *Diesel*

• Looks too tough for a rubber-tired tractor shovel. But, Waukesha-powered with a 135-DKB Diesel, this 2¼ yard Michigan 175-A is excavating granite overburden in development work at the Crystal fluorspar mine, near Darby, Montana, at 6900 ft. elevation. 500 tons per 7-hr. day! Good going, but it takes power and lots of it—the smooth, speedy, flexible power of a Waukesha Diesel. This same 175-A Michigan loads fluorspar ore, too, "hopping" from one 12-ft. bench to another . . . to blend the grade of ore which varies at different bench levels. 400 blended tons per 7-hr. day takes speed and mobility.

339

135-DKB Diesel—4¼-in. bore x 5-in. stroke; 426 cu. in. displacement, with counterbalanced crankshaft. **Get Bulletin 1573.**



WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

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ature distribution as a function of time and climatic conditions in the pavement, base course, and subgrade. This will be accomplished by the placing of resistance-type temperature gages in the pavement base-subgrade system, at such locations as to develop the vertical and transverse temperature distribution. In the same area that temperature gages are placed, the pavement surface will be spotted with transverse plugs, so that the relative profile can be measured. In addition, the No. 3 bars will be instrumented to determine the warping strains in the steel.

There will be a crack survey in which the average crack widths, at selected stations, will be measured in addition to a total crack count. As a means of quantitatively measuring the riding qualities of the continuously reinforced pavement, it is anticipated that a road-roughness survey will be conducted.

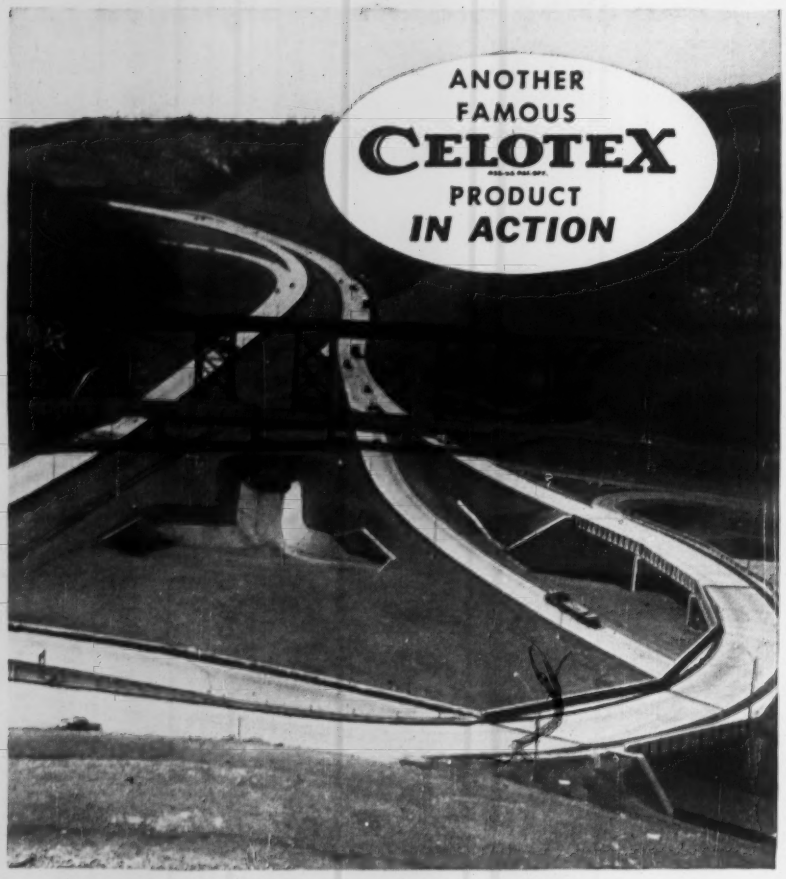
An overall traffic count will be made in order to measure the dynamic effects of traffic on pavement performance. Specific information will also be obtained with regard to the strain behavior of the steel under the influence of moving loads, by means of strip chart recorders, and trucks of known weight.

• **Conclusion**—The experiments being conducted have barely been started, it is therefore practically impossible to come to any set conclusion at this time. Despite the high strains measured at an early stage, there is reason to believe that the continuously reinforced pavement will perform satisfactorily, according to the scientists.

The study to date has indicated that the hypothesis of areas of complete restraint is valid. Possibly the crack survey will bear out the rest of the theory regarding residual strains in the end areas.

The part that the bond area of the steel plays in the total picture was not covered, but should not be ignored. The project at Lehigh is committed to the use of a fixed size and percentage of reinforcing bar, based on standard designs. It is the opinion of Professor W. J. Eney, Professor R. L. Schiffman, and Mr. I. J. Taylor that the magnitude of the crack width, crack frequency, and the strains in the steel, are directly relatable to the bond surface available in the steel. It is hoped that other investigations in this field will consider this fact, so that it will be opened to experimental verification.

In addition, the professors hope that other future investigations in this area open the door to studies of the effect of traffic vibrations on pavement behavior, and in particular, to the repetitive action on the shearing strength mobiliza-



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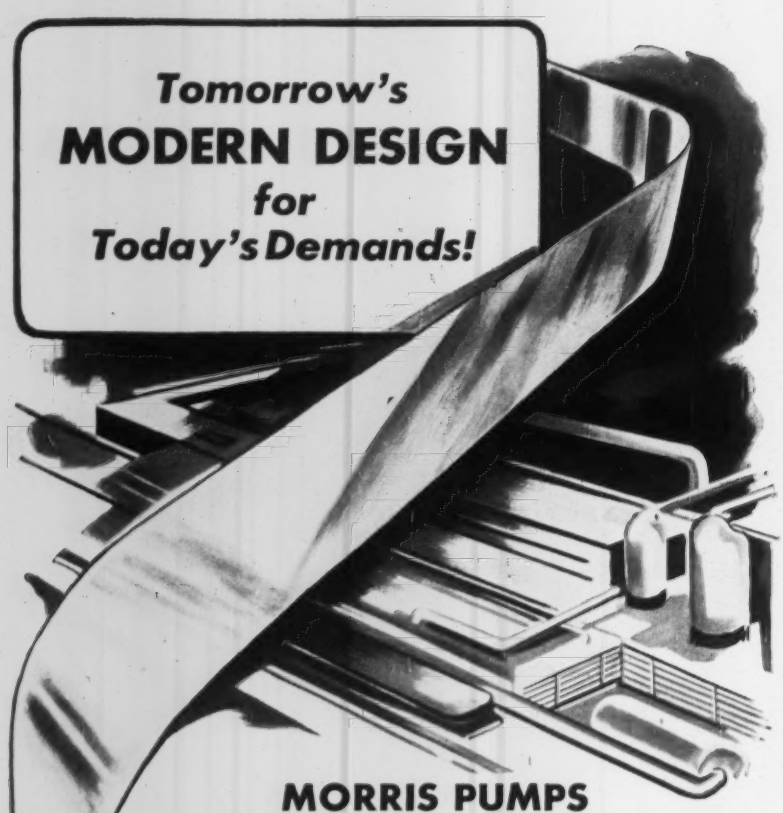

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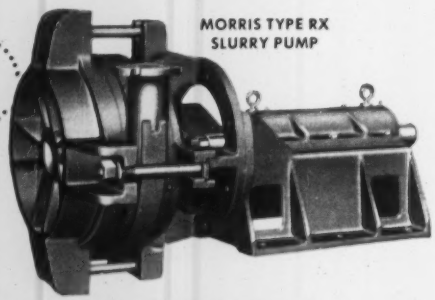

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tion between the pavement and subgrade.

The work by Lehigh University was carried out by the personnel of the Fritz Engineering Laboratory with Professor William J. Eney as director.

Engineering Teachers

Shortage studies starts with $10,000 NSF grant

First phase of a comprehensive study of how American engineering colleges may attract and keep top-flight engineering teachers for their growing numbers of students is about to get under way following a recent $10,000 grant by the National Science Foundation.

The American Society for Engineering Education, sponsor of the project, says the grant will be used for preliminary work on a study "to determine and describe in detail the character and magnitude of the manpower and related financial needs of engineering colleges" and for organizing a full-scale attack on the problem.

Titled the Development of Engineering Faculties, the project is under the direction of an ASEE executive committee, with Dean Harold L. Hazen of the Graduate School of Massachusetts Institute of Technology as chairman. Executive director is William H. Miernyk, director of the bureau of business and economic research, Northeastern University. The bureau's facilities will be used in the study.

"The first step in the project," says Dean Hazen, "is to find out in some detail what shortages now exist and how great are the faculty needs now anticipated by engineering colleges."

In the project, the ASEE has the support of the Engineers Council for Professional Development, Engineers Joint Council and the National Committee for the Development of Scientists and Engineers.

Indians to Take Ancestors On 50 Mile Relocation Trek

An entire South Dakota community —including its graveyard—is to be moved to a new site 50 miles away. Cheyenne Agency, headquarters of the Indian Service for the Cheyenne River Reservation of the Sioux, is to become a part of Eagle Butte, S. D., vacating a site that will be under 90 ft of water backing up behind Oahe Dam on the Missouri River.

The job of moving the living and their ancestors will run to $19 million. The relocation project is under the Omaha District Office of the Corps of Engineers.

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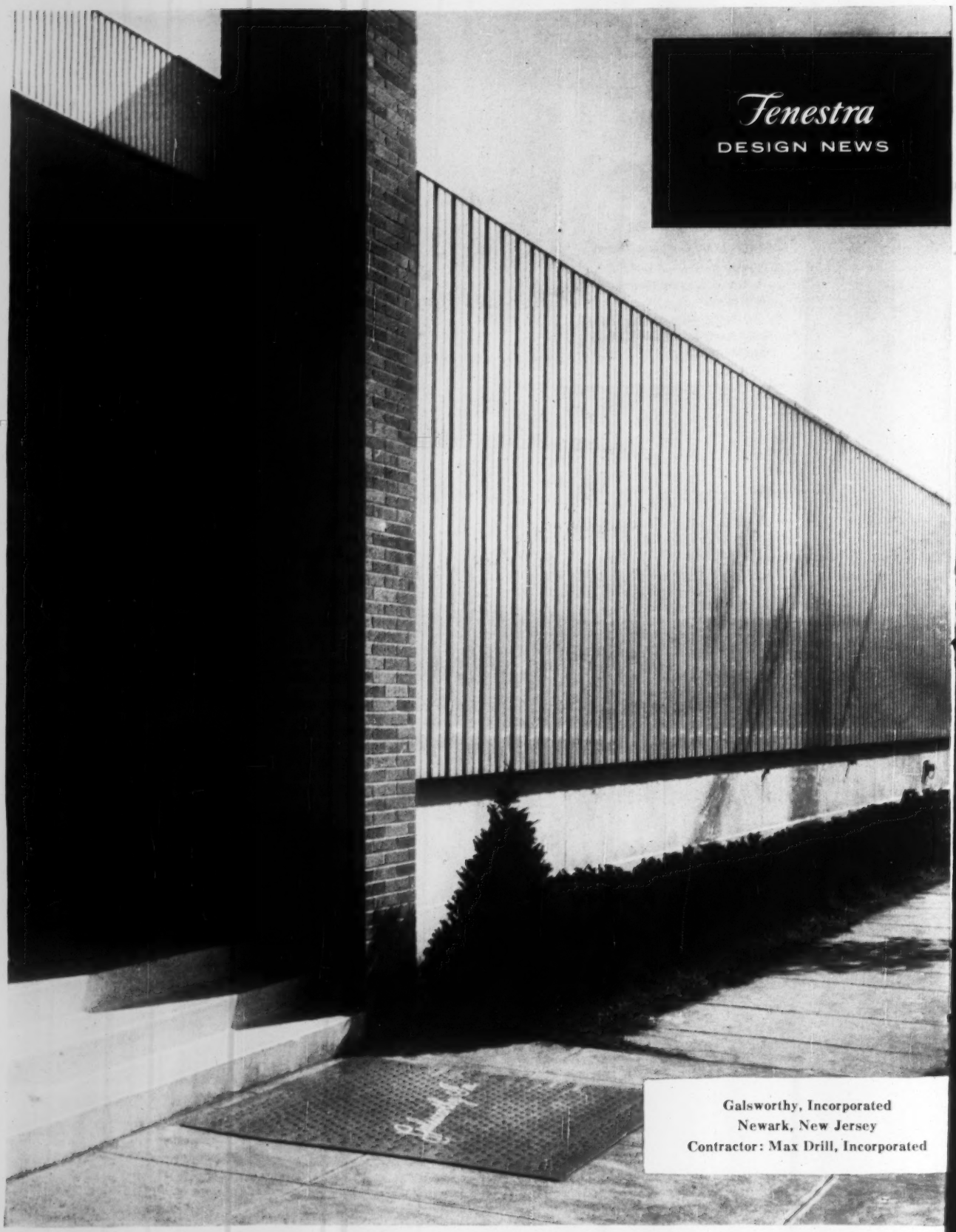
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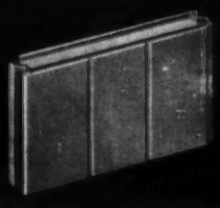

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NEW Fenestra Insulated Wall Panels*

CUT PLANT CONSTRUCTION COSTS!

To meet your demand for better looking, more efficient, lower cost wall panels for curtain wall construction, Fenestra introduces two new insulated metal wall panel products. Based on more than a quarter century of experience in the design and erection of this type of construction, these new Fenestra Insulated Metal Wall Panels give you many important advantages for industrial, commercial and other types of buildings.

Fast, easy erection—Lightweight, large area Fenestra Wall Panels are quickly attached by welding or bolting. Your buildings can be enclosed in days rather than weeks. This saves labor costs and gives the owner quick occupancy and a faster return on his investment. New Fenestra Type "FA" Panels are designed for field assembly for extra economy.

Distinctive appearance—New Fenestra Type "FA" and Type "C" Panels give the designer a choice of exterior appearance. The "FA" Panel provides a dramatic, deeply revealed fluted surface to create bold shadow lines that give distinctive beauty to any façade. The "C" Panel gives you a smooth flush surface and may be installed vertically or horizontally. Either panel is available in galvanized steel or a new grain-textured aluminum that hides scratch marks and reduces maintenance. There are also many exciting design possibilities in colorful field painting or in porcelain enamel finishes on aluminum.

High insulating value—Fenestra Metal Wall Panels provide insulating values better than a 16" masonry wall furred and plastered. U-factors range from .08 to .19 depending on panel type. Two-pound-density glass fiber insulation with excellent nonsettling properties is used. Since the panels are only 3" deep, this efficient insulation value means extra floor space for your buildings within the same foundation area.

Structural steel savings—Due to the lightweight construction possible with Fenestra Insulated Wall Panels, important savings are possible in the structural steel framework and foundation of your buildings.

Low-cost expansion—When the panels are attached by bolts, your building can be quickly expanded. The panels are removed, the addition erected and the panels reinstalled with minimum time and cost. Fenestra Wall Panels have been re-used as many as three times in plant expansion programs.

The New Fenestra Wall Panel catalog gives you complete details and design data on Fenestra Type "FA" and Type "C" Insulated Metal Wall Panels. Mail the coupon, below, for your FREE copy or call your local Fenestra representative—listed in the yellow pages.

*Trademark

Fenestra
INCORPORATED
INSULATED METAL WALL PANELS

Your Single Source of Supply for
BUILDING PANELS • DOORS • WINDOWS

Fenestra Incorporated
Dept. ER-5, 2286 East Grand Boulevard
Detroit 11, Michigan

Please send me FREE copy of New Fenestra Wall Panel Catalog.

NAME _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____

One of Watkins' 26 Macks receiving a load of crushed gravel from a crusher fed by a 1¾-yard shovel.

on the Spaulding Turnpike . . . big-yardage fills at low hauling costs

Grading a three-mile section of New Hampshire's Spaulding Turnpike, R. G. Watkins & Sons, Inc. of Amesbury, Massachusetts, put down 1,580,000 cubic yards of common borrow and 100,000 cubic yards of gravel. This pike, with two 24-foot lanes separated by a 12-foot median, is a 22-mile addition to the Seacoast Turnpike near the White Mountain area. High fills along the Cocheco River and at intersecting roads required big yardage borrow.

Fourteen of the 17 dumpers used by Watkins & Sons on this high-volume hauling were Macks. Here's the kind of job where Mack efficiency and dependability really pay off in minimum hauling costs. The ability to maintain tight schedules, to keep going month after month with only routine servicing and maintenance, and to operate with ease over difficult terrain and in all kinds of weather puts Macks in a class by themselves for real profit-making performance. Reason enough why Watkins & Sons has 26 Macks in its fleet of 32 dumpers.

Why not let your Mack representative bring you up to date on the most complete line of heavy-duty trucks in the industry? Dumpers, mixers, tractors, flat-bed trucks—there's a Mack that will do your toughest jobs more economically, more efficiently, and more profitably. Mack Trucks, Inc., Plainfield, N. J. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

5023

"Hurricane General" Moves On

New England flood fighter leaves division command in a flurry of flood control construction work

Brig. Gen. Robert J. Fleming, Jr., hit New England in January, 1955, just in time for two years of flood fighting, flood recovery and flood control efforts. Last month, he left the New England Division Engineer post for an assignment in France that ought to give him an earned rest from hurricanes and floods.

He is the new commanding general of ADSEC, Advanced Section of the European Communications Zone, embracing all military depots and supply and transport facilities in northern Europe.

Winds of 1954's hurricanes had subsided in New England when General Fleming took charge of the 1,600 man Boston office. But the 1955 ordeal that followed was worse, with its floods in the narrow river valleys and along the ocean front.

The short, bespectacled general took to the air for a whirlybird-eye-view to oversee flood fighters and recovery operations. More important (for the long-range protection of the area against floods), he took to the speaker's platform, wherever he found it, in a fight against local apathy and opposition to river control projects.

The drive to induce New England to protect itself against floods was not easy. But at present the six-state area is humming with some $150 million in flood control construction.

It took a lot of speech-making—all the way from town meetings to a joint session of a state legislature. But it apparently paid off. The general is not an impressive looking man; in a business suit he would pass as almost anything but a high ranking Army officer. But his dress-blue uniform does a lot for him, and as a speaker his blunt and persuasive straight-talk is impressive.

In New England he maintained a road-show schedule of speaking engagements, sometimes three a day.

• **Efforts rewarded**—Summing up his New England experiences, General Fleming recalled recently that when he took over, "We didn't have a dime for new civil work . . . and even maintenance money was darned slim.

"We're now actually spending $25 million a year largely on flood control and navigation improvements in addition to $110 million on military projects."

General Fleming recalls that the first thing he did "was to figure out where we were going to get clobbered by flood. Then I started a campaign to talk flood control."

Typical of his talks was one that he gave on July 14, 1955, to a group of Connecticut people, warning that there was trouble ahead. One month later, the devastating floods of August, 1955, hit the valley towns in the Nutmeg State.

If the needed projects had been built before the floods, General Fleming claimed the damage to the towns would have been cut by 75%.

The Engineer Corps won the gratitude of scores of communities for its work in that disaster period. One of its principal contributions to recovery was the erection of 67 Bailey bridges to open highways into communities isolated by destruction of river spans.

Many of those bridges were ordered personally by General Fleming, and they began to move into the area from the Marion, Ohio, depot days before any official authorization had been issued to endorse the general's slashing of service red tape.

General R. J. Fleming

• **Construction fostered**—Typical of the flood control projects planned under General Fleming and about to be launched are these:

• A $16 million flood dam on the Naugatuck River at Thomaston, Conn., where relocation of the New Haven Railroad is about to start.

• The Bald Mountain Reservoir Dam on West River, near Londonderry, Vt., a $16 million project about ready to go into construction.

• An $11 million dam at Townshend, Vt. Land is now being acquired, plans are complete and road relocations have begun.

• The Black River Dam at North Springfield, Vt., costing about $10 million, the contract to be awarded about May 15.

• **Legislation enacted**—Associates say that the general privately considers his most gratifying achievement in New England has been in breaking down 11 years of apathy and opposition toward a flood control dam by New Hampshire residents of the Merrimack River Valley.

General Fleming carried his fight for this big dam at Hopkinton-Everett on the Massachusetts line directly to the New Hampshire legislature when he addressed a joint meeting of both chambers last Jan. 31. Six weeks ago, both the House and Senate approved the necessary compact with Massachusetts. General Fleming left New England content that a major obstacle has been cleared from the project's path.

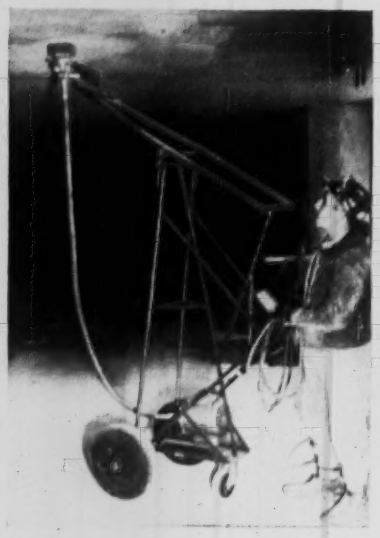
The son of a calvary officer, Robert J. Fleming, Jr., was graduated from West Point in 1928 and from Massachusetts Institute of Technology in 1931. He was a major on the general staff at Pearl Harbor the day the Japanese struck and narrowly escaped being hit in a strafing attack.

He had a variety of engineering command assignments in World War II in the Pacific and European Theaters and returned to U. S. from Europe in 1947.

Going back now after 10 years, General Fleming is looking forward to renewing his acquaintance with Sir Donald Bailey—inventor of the famed bridge which the general used to such good advantage in the rough days following the New England floods.

(*M&J continued on page 108*)

RUBBING CEILINGS?



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CEILING

GRINDER

- **FASTER AND EASIER:** One man will average almost 4000 sq. ft. per day. Does not need scaffolding.
- **CHEAPER AND BETTER:** Money saved on finishing will help pay for grinding.
- **DEPENDABLE:** Individual GIRAFFES have worked more than 1,000,000 square feet without major overhaul.

GIRAFFE ®

- Heights up to 24 ft.

Has been adapted to cleaning ceilings.

CONCRETE GRINDING CORP.

19 MECHANIC ST. NORWALK, CONN.

W. M. Hogg's successor is . . .

Ontario Hydro's W. L. Fraser

Engineers Change at St. Lawrence Project

New field project engineer for Ontario Hydro's St. Lawrence Power Project is William L. Fraser, succeeding William M. Hogg. The recent appointment was announced by Otto Holden, chief engineer for the Ontario Hydro-Electric Power Commission, Toronto.

Mr. Fraser has been serving as project manager for the commission's Sir Adam Beck Niagara No. 2 development. He also has held the position of project manager for Ontario Hydro's Chenaux development on the Ottawa River, and early in his career he served as assistant chief engineer for the Nova Scotia Department of Highways and Public Works. Mr. Fraser was graduated from Dalhousie University in 1915 with a BA degree and from McGill University in 1917 with a B.S. in civil engineering.

Mr. Hogg leaves the commission to take a senior executive post with the Great Lakes Power Co., Ltd., at Sault Ste. Marie, Ont. Field project engineer for the Hydro's St. Lawrence project since May, 1954, Mr. Hogg has a long history of service with the company. He started as water boy on the commission's Sir Adam Beck Niagara No. 1 development and moved up to senior engineering positions on three major Hydro construction jobs.

A 1939 graduate of the University of Toronto in civil engineering, Mr. Hogg has been, for Ontario Hydro, designing engineer in the generation department, senior resident engineer on the Des Joachims development on the Ottawa River and assistant field project for the Niagara power project.

Working for Ontario Hydro runs in the Hogg family—his late father, William Hogg, Sr., was a member of the commission's construction department and his uncle, Thomas H. Hogg, is a former chairman and chief engineer for Ontario Hydro.

Montana Names New Head For State Road Bureau

Fred Quinnell, Jr., who has been assistant state highway engineer, has been named to succeed Scott P. Hart as Montana state highway engineer. Mr. Hart submitted his resignation several weeks ago.

A member of the engineering staff of the highway department for more than 30 years, Mr. Quinnel graduated in civil engineering from Montana State College in 1926.

Contractor Groups Name Schilling as Secretary

Frederick E. Schilling, former vice president of Turner Construction Co., has been appointed secretary of the Building Contractors and Mason Builders Association of New York City and executive secretary of the Cement League and the Master Carpenters Association. Mr. Schilling succeeds the late C. M. Shannahan.

Known in the construction industry for his work in labor relations, Mr. Schilling has served in the past as president of the Cement League and member of the board of governors of the Building Trades Employers' Association, and on the executive committee of the Building Contractors and Mason Builders Association.

Contractors get better concrete jobs faster no matter what the weather with Columbia Calcium Chloride added to the mix.

STAY AHEAD OF PEAK-SEASON SCHEDULES

COLUMBIA CALCIUM CHLORIDE helps you complete jobs days sooner

Your tightest working schedules of the year are just a flip of a calendar page ahead. This makes today a fine time to plan ways to cut time on your summer concreting. And you want to save that time without shaving job quality.

The higher early strength of Columbia Calcium Chloride treated concrete saves more time *and* upgrades quality, too. Take concrete made with Type I cement. When treated, its three-day strength matches normal seven-day results. With Type III (High Early Strength) cement, the treatment produces normal 28-day moist-cured strength in just 3 . . . yes, 3 . . . days! Columbia Calcium Chloride gives much better curing, releasing the normal heat of hydration earlier. Moisture loss through evaporation is retarded by 50% at highly important early stages. This is vital in reinforced structural work, where highly stressed members are subject to early moisture loss.

Check all these points: greater strength in half usual times, higher ultimate strength, earlier form removal, faster and easier finishing. How about it? Isn't it the perfect time to analyze your own batching procedures, or talk to your ready mix supplier about adding Columbia Calcium Chloride? You can get immediate, detailed information from your nearest Columbia-Southern district office or from our Pittsburgh address.

Reduce barricade time and open concrete surfaces for service days sooner by using Columbia Calcium Chloride.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

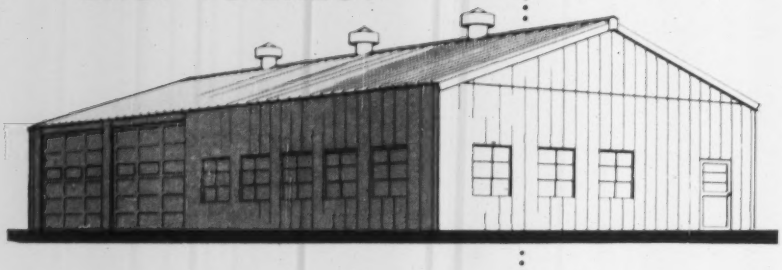
DISTRICT OFFICES: Cincinnati • San Francisco
Chicago • Cleveland • Boston • New York
St. Louis • Minneapolis • New Orleans • Dallas
Houston • Pittsburgh • Philadelphia • Charlotte
IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

The Expansion Trend is to

PARKERSBURG

METAL BUILDINGS

- VERSATILE
- LOW COST
- EASY TO ERECT



Pre-Engineered Parkersburg metal buildings are saving and serving in literally hundreds of applications right across the board in industry. These precision-fitted units ranging in size from tool sheds to factories, feature unique "seven-fold" interlocking panel joints which offer the tighest, most rugged weather seal available today. Easy to erect, move, and enlarge, these attractive maintenance-free buildings are the practical answer to quick-expansion needs.

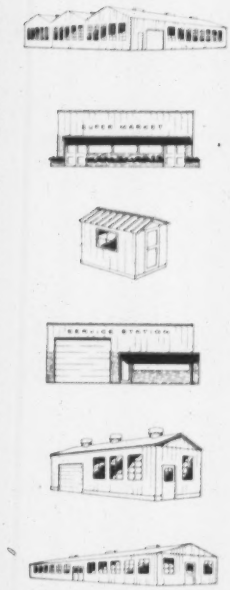
Parts are ready for assembly in the field... buildings can be finished on the inside and insulated against extreme temperatures.

Let Parkersburg help you save time and reduce construction and maintenance costs. Write today to Department A-1 for additional information.

60 Years of Successful Service!

THE PARKERSBURG RIG AND REEL COMPANY
Division of Parkersburg-Aetna Corporation
Parkersburg, West Virginia

"WISE IN THE WAYS OF METAL BUILDINGS"



Factory Locations:
Parkersburg, West Virginia
Pomeroy, Ohio
Coffeyville, Kansas
Houston, Texas

Building Division Sales Offices:
Dallas, Atlanta, New York, Chicago, Parkersburg

BUILDING
PARKERSBURG
DIVISION

. . . Men and Jobs

Mr. Schilling, a 1908 graduate of the Thayer School of Engineering, Dartmouth College, spent his entire career with Turner. He was elected vice president in 1928 and a director in 1935. He was in charge of the company's labor relations from 1946 until his retirement in 1956.

Careers

Business:

Frederick A. Davidson, Jr., has been appointed vice president of Chesebro-Whitman Co., Inc., New York scaffolding manufacturer and contractor.

Verne Ketchum has been made director of engineering of Timber Structures, Inc. **George Birkemeier** succeeds him as chief engineer. At the same time, **Charles Woodworth** has been named development engineer for TSI.

Lawrence C. Miller has become field engineer, covering Spokane and parts of Washington and Idaho, for the Portland Cement Association.

Marion Power Shovel Co., a division of Marion Universal Corp., has announced appointment of four new officers. **Robert Campello,** formerly general sales manager, and **Martin R. Tuttle,** previously general works manager, have been named vice presidents. **William R. LeMasters** has been promoted from treasurer to secretary-treasurer and **David Reich,** formerly a management engineer, is now assistant to the president.

William L. Abramowitz has been elected president of Carlon Products Corp. of Cleveland, manufacturer of plastic pipe and custom fabricated fittings. Formerly he was vice president of the Borden Co.'s Chemical Division.

Government:

State Senator **Charles M. Maddox** has been named to the Indiana State Highway Commission, in place of **William H. Sorrell.**

Frank M. Williams, a veteran of 25 years service with the Ohio Department of Highways, has been made Division Engineer of the eight county Division No. 6.

Thomas C. Gay has been appointed Luzerne County maintenance superintendent by the Pennsylvania Department of Highways.

E. C. Gunter, Jr., former city planning director at Durham, N. C., has been chosen as city zoning director for Greenville, S. C.

Frank C. Leighton has been appointed city building commissioner for Cincinnati. He replaces **Fred McMinn,** who retired.

No "Cure-All," but...

Salinas, California, finds a single grade of Bitumuls® solves five paving maintenance problems

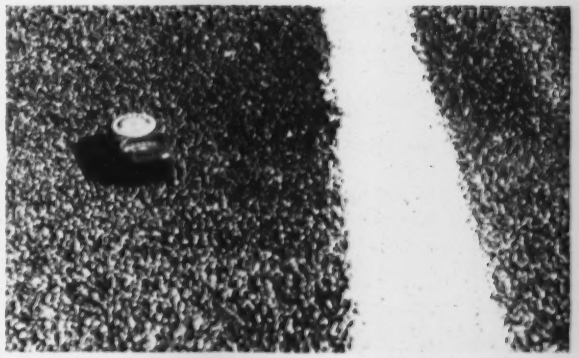
HERE'S A SITUATION common to most growing cities: annexation of outlying residential developments has vastly expanded the street maintenance job *without* materially increasing available funds. Annexation has not only added to the street mileage, but has "contributed" many sub-standard pavements to the street system, thus adding to the complexity of the job.

In an effort to solve this problem, these three Salinas men most directly concerned have worked together: Thomas A. Dunne, Director of Public Service; his assistant, Al Rossi; and Harry Adams, Maintenance Supt. Their search for simplicity and standardization led them to look for a versatile asphalt material that would do many jobs. They found it in Bitumuls SS-1, an asphalt emulsion that can be handled and used without heating, in small quantities or large.

Now, stored in a single 25,000-gallon tank, Bitumuls SS-1 is used for: Patching, Tack Coats, Prime, Seal Coats & Surface Treatments, and for Base Stabilization. In addition, Salinas City Forces can also use this same grade of Bitumuls for the new Slurry Sealing; and—at high dilution—for dust-laying on unpaved, outlying roads. All of these jobs can be done with existing equipment: a grader, a "Pulvimixer", a water wagon, two distributors, and a roller.

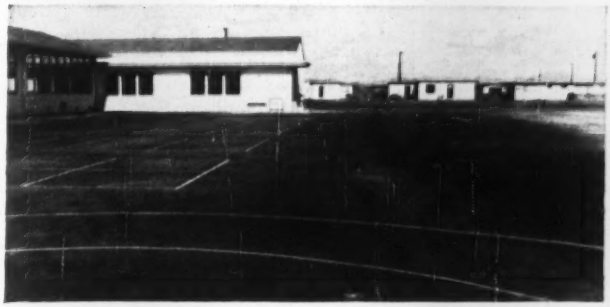
The obvious economies resulting from the use of this one material for all these jobs merit investigation by paving maintenance men everywhere, regardless of the size of their community.

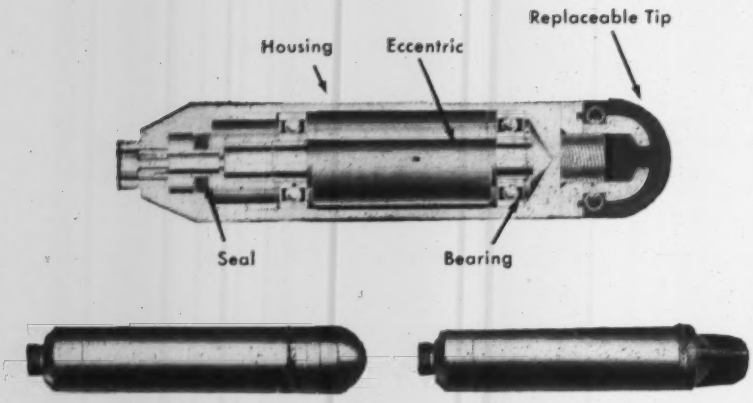
There's a Bitumuls man near you who can supply details. *Call him, today, or write:* **American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 20, Calif.**



(Top), "PULVIMIXER" reworks old pavement that has been scarified and bladed in restabilization operation. Distributor applies Bitumuls at ¾ gal./sq. yd. per inch of depth. (Center), DISTRIBUTOR applies prime on a waterbound base, using Bitumuls SS-1 diluted (2 parts SS-1 to 1 part water) at 0.3 gal./sq. yd. of dilution. (Bottom), HERE'S A CLOSE-UP of the finished texture of a Bitumuls SS-1 Seal Coat pavement.

(Right), SALES ENGINEER Bob Ridell, far left, of American Bitumuls & Asphalt Co., discusses plans with Tom Dunne, Director of Public Service for Salinas, and his assistants. At far right is a partial view of the 25,000 gal. storage tank. (Below), EVEN SCHOOL YARDS are given stabilized bases with Bitumuls SS-1.





SIMPLE DESIGN — Short head Viber vibrators are simple in design and have few parts as indicated in cut-away picture above. Head assembly with replaceable rubber tip is shown at left. Assembly with 3-finned steel-cast tip at right.

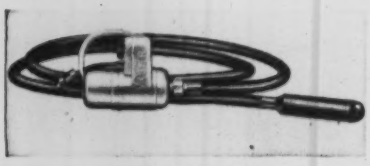
Short Head Viber Vibrators Offer Major Advantages in Placement of Concrete

VIBER VIBRATOR heads are short, easy to manipulate—simple, easy to maintain. Simple construction of the Viber head makes a compact assembly which maneuvers easily around steel and into awkward, hard-to-reach places.

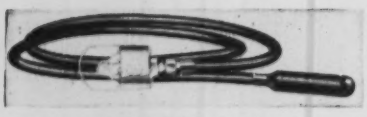
The Viber design utilizes a single eccentric weight in a heat-treated alloy steel housing. Other parts are one bearing at each end of the weight and a grease seal. Viber patented replaceable rubber tip is standard equipment, with 3-finned steel cast tip optional.

Viber heads are light weight, ranging from 6 to 16 pounds... 11 to 12 inches in length and are available in four diameters—1¾ in., 2⅛ in., 2½ in. and 3 in.

Flexible shaft driven, Viber vibrators are powered by electricity, gasoline or air... easily adapted to varying job conditions. They are high speed, operating at speeds between 8500 and 11,000 rpm.



Model E Electric



Model P Pneumatic

Model G Gasoline

Viber Replaceable Rubber Tips

Viber rubber tips save contractors thousands of dollars yearly by preventing damage to forms of plywood and other expensive materials. In addition, since most wear on a vibrator occurs on the end of the housing, use of replaceable rubber tips greatly extends housing life.

Viber vibrators are effective. More work can be done in less time and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.

For complete information on Viber vibrators and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif. Dept. **16E4.**

VIBRATORS SINCE 1931

Obituaries

George H. Davis, one of the founding partners, in 1894, of Ford, Bacon & Davis, Inc., New York died May 3 at the age of 93. Mr. Davis who graduated from Cornell University in mechanical engineering in 1892, was one of the pioneers in the construction and operation of electric street railways.

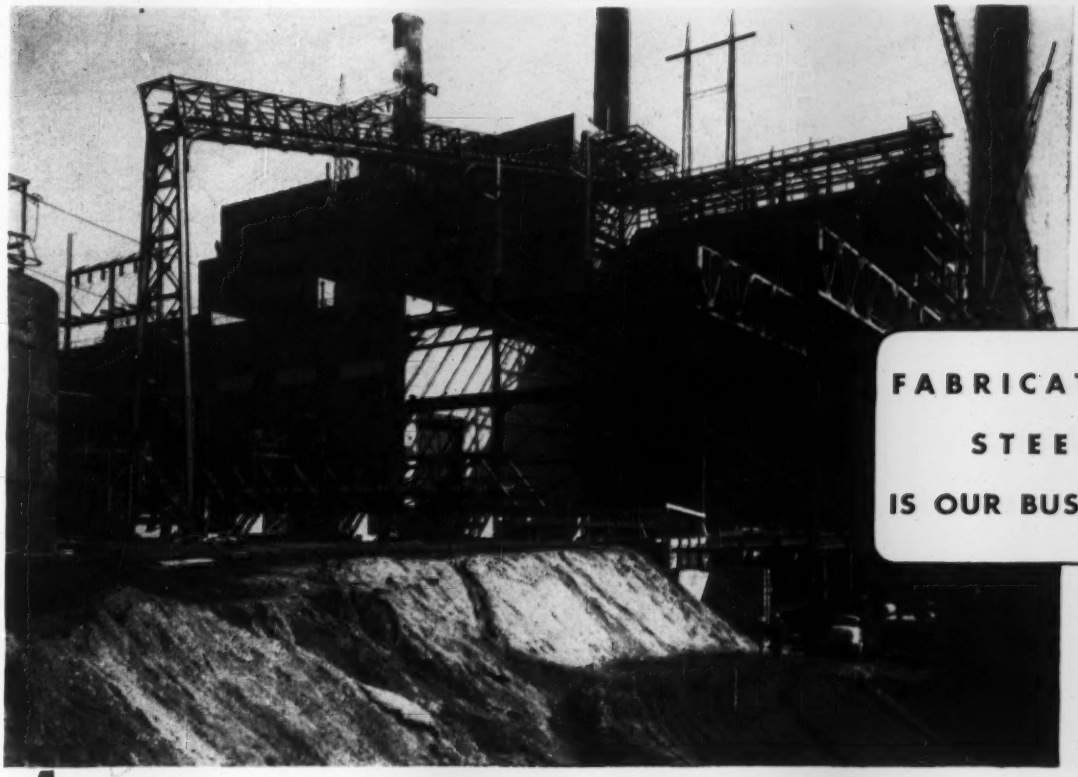
George M. Wells, 77, whose engineering career began on the construction of the Panama Canal, died in Glen Ridge N. J., May 4. On the Canal he was chief of party, then engineer in charge of design on the Atlantic Division. Later he was head of the Municipal Division. Working under Maj. Gen. George W. Goethals in Panama, he subsequently was a partner in the Goethals consulting firm. From 1923 until 1945, when he opened a consulting office of his own, Mr. Wells was an officer director in a number of industrial companies particularly in the chemical field.

Henry Gerharz, 78, of St. Paul, former surveyor-general for Montana, died April 24. Appointed surveyor-general by President Woodrow Wilson in 1914, he served until 1920, when he organized the engineering firm of Gerharz & Jaquet at Great Falls. Later he served as project engineer for the U. S. Bureau of Indian Affairs on the Shoshone Reservation until retirement in 1949.

John C. Rector, 62, industrial division sales manager of Philip Carey Manufacturing Co., died in Cincinnati April 22.

Allen S. Hackett, 77, former president of the Louisiana Engineering Society, died in New Orleans April 23. Graduated in 1903 from Tulane University with a bachelors degree in civil engineering, he spent 12 years in railroad construction in Honduras. During World War I he was a captain in the Corp of Engineers, and after the war entered private engineering practice. At one time he served as president of New Orleans-Gretna Bridge Co.

Oscar H. Murray, 74, New York architect, died April 23 at Rhinebeck, N. Y. Mr. Murray was born in England and studied architecture there in the Birmingham Art and Technical School. He joined the office of Cram, Goodhue & Ferguson, New York, in 1908, two years after coming to the United States. In 1925, he became a partner in Mayers, Murray & Phillip. In 1940 he moved to Rhinebeck, where he continued to practice.



FABRICATING STEEL IS OUR BUSINESS

Ohio Power Company, Muskingum River Steam Plant, Unit #3. Steel Erection: The Ingalls Steel Construction Company.

RELIEF AT RELIEF (in Ohio)!

One of the richest industrial areas in Ohio lies along the 110-mile Muskingum River. Units #3 and #4 of the Ohio Power Company's big plant at Relief, Ohio, are important additions in this company's program . . . to meet the demands for more power.

6,000 tons of Ingalls' fabricated steel is going into the construction of the two added units of the Relief Plant. The fabricated steel is being erected by The Ingalls Steel Construction Company.

Ingalls' long experience, skill and ability in power plant requirements for fabricated steel have served importantly in the construction programs of 46 of the nation's leading power companies. Other thousands of commercial and industrial buildings are standing proof of Ingalls' ability to meet *all* demands, where fabricated steel is an important factor.

Can we help you? *Ingalls can serve you better* . . . for complete information regarding *why* and *how*, write:

INGALLS' PLANTS GREATLY EXPANDED

Capacity has been increased nearly 70% at Ingalls' Plants within the past three years . . . part of a program designed to give Ingalls the facilities to meet every modern requirement for fabricated structural steel for any construction purpose.

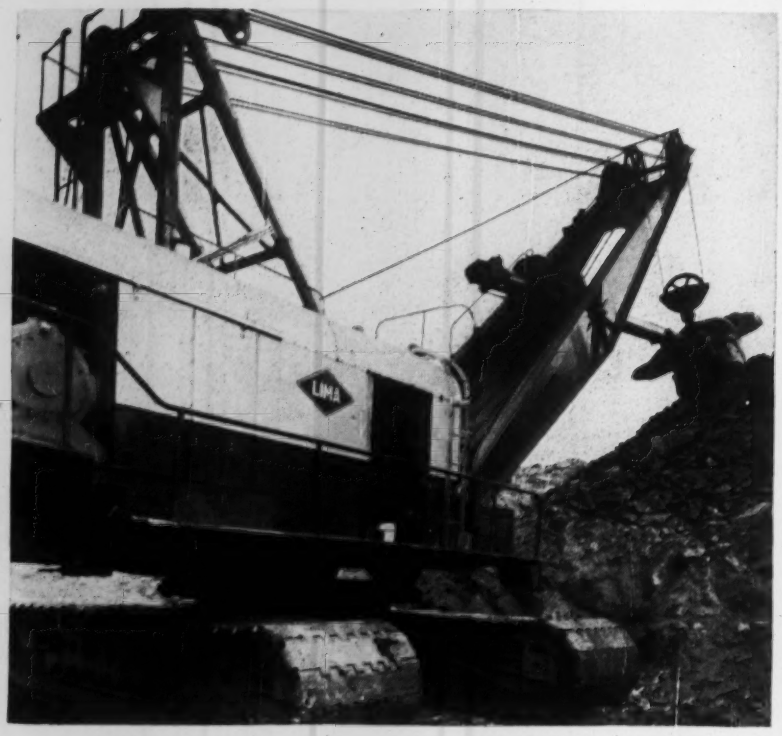
THE INGALLS IRON WORKS COMPANY

Established 1910

BIRMINGHAM, ALABAMA

Plants: Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Decatur, Ala., Pascagoula, Miss.

FABRICATED STEEL for Power Plants • Hangars • Stadia Stores • Bridges • Office Buildings • Theatres • Hotels Apartment Houses • Hospitals • Churches • Schools • Industrial Buildings • Tanks • Bins • Pressure Vessels • Stacks



No chance that scooping up 6 cubic yards of dirt will stall the engine powering this shovel. It has a National Torque Converter absorbing 490 hp. Other converter sizes range from 100 to 1000 horsepower capacities.

How to give big machinery a non-stall engine

You simply install a National Torque Converter. With that, it becomes practically impossible to stall or even overload the engine. It also becomes almost automatic for the machine to put out a bigger day's work.

As illustration, the bucket of a big power shovel may bite a bigger rock than it can lift. Ordinarily, the engine would stall, the whole power train would take a walloping shock load, and time would be lost. But with a National Torque Converter, the engine would not stall even if the bucket were stopped dead.

This is because a National Torque Converter regulates power and speed automatically, and does it quicker, more smoothly than a human operator can. In this way it lets the operator concentrate on other parts of the job to be done. The engine operates at optimum capacity all the time, whether the load is light or heavy. The torque converter acts as a fluid cushion to protect the engine and other parts of the machine from vibration and shock. Total maintenance costs take a nosedive.

A National Torque Converter may make your big, heavy-duty machinery more productive and more profitable. To get the whole story, write for an engineering appraisal of your power transmission problem to: The National Supply Company, Two Gateway Center, Pittsburgh 22, Pennsylvania.

THE NATIONAL SUPPLY COMPANY

INDUSTRIAL PRODUCTS DIVISION

Two Gateway Center, Pittsburgh 22, Pa.

Pace-setters in the progress of industrial power transmission

Legal

Prior Claim

Money in Hands of Surety Not Subject to Tax Lien

Where a contractor has given money owed a subcontractor to a surety for application against claims of the sub's materialmen a federal court in North Carolina has ruled that the federal government cannot attach the money to satisfy a tax claim against the subcontractor. The facts appear below.

In March, 1952, Osceola Construction Co. entered into a contract to erect a housing project at Hogansville, Ga., and as prime contractor entered into a subcontract with Floyd Miller Plumbing Co. for the plumbing and heating work required by the prime contract. As required by the Miller Act, the subcontractor furnished a surety bond to secure performance of the contract and payment for all labor and materials furnished the subcontractor.

By June, 1953, the subcontractor had completed all the work called for by its contract except for some minor items of work. At this time there was $5,536.09 owing to the subcontractor for the work performed under its contract. The subcontractor became insolvent and owed Square Supply Co. the sum of $14,133.98 for materials furnished it in the performance of the job. The prime contractor gave the surety company a check for $5,536.09, the balance remaining unpaid to the subcontractor. The check was made payable to the surety and the subcontractor. The subcontractor endorsed the check and left it with the surety company to be used for the payment of materials furnished for the job. It is noted that the check covering the balance due the subcontractor was less than half of what the subcontractor owed the materialman.

The materialman made repeated requests to the surety for payment for materials, but the surety refused to pay. While this money was in the possession of the surety, the Internal Revenue Department filed a lien against the subcontractor for unpaid Federal Unemployment and Withholding and Social Security taxes, the total amount of such liens amounting to $5,860.46 with interest. The government contended that under the federal laws, the United States was entitled to a lien against all property and rights to property, real and personal, belonging to the subcontractor.

The surety then brought an action against the subcontractor and the supplier of materials to determine who was

(Based on Company File # 9A003123)

The ground gave way

. . . but our Hartford Contractors' Equipment policy gave us the solid protection we needed!

Just as we were inching our crane around the pilings on a river bank, the ground gave way . . .

Of course the accident *would* happen to a brand-new rig! We'd had it less than six weeks. And there it was — wrecked.

I called my Hartford Agent. He set my mind at rest immediately. He reminded me of the automatic 45-day protection we had on new equipment under our Hartford policy. And he had an adjuster on the job in a matter of hours.

There wasn't any red tape. Not a bit! We repaired the crane. The Hartford Fire Insurance Company promptly paid us $3,232.10. ●

Your investment in equipment ties up a lot of your money. Too much to take chances with.

So play it safe. Get the broad coverage offered by a Hartford Contractors' Equipment Policy. Then you're covered against loss by overturn . . . collision . . . fire . . . theft . . . explosion and other specific hazards.

No time like *now* to look into this. Call your Hartford Fire Insurance Company Group Agent or your insurance broker today. You'll be glad you did.

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New York Underwriters Insurance Company
New York 38, New York
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Twin City Fire Insurance Company
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entitled to the money representing the balance due the subcontractor. As the government claimed it had the right to this money, it intervened in the action.

The court held[1] that since the money in the possession of the surety was turned over to it to be used for the payment of materialmen, the subcontractor had no right to such funds. It followed as a matter of law that the United States did not have any tax lien on the money paid by the contractor to the subcontractor's surety for federal taxes owed by the subcontractor.

(1) United States Fidelity and Guaranty Co. v. Miller, 143 F. Supp. 941, U. S. District Court of North Carolina, Sept. 4, 1956.

Determination of Dispute By Architect or Engineer

Is determination of a contract dispute by the architect or engineer conclusive?

This is how one of the state courts has answered the question:

"It is the general rule that the decision of the architect or engineer as to what does or does not constitute extra work, where the contract, as it does here, provides that his decision shall be final and binding, is conclusive and controlling on both the owner and the builder, unless he acts arbitrarily, dishonestly or under a demonstrable mistake of fact. 17 C.J.S., Contracts, Section 371, page 853. See also Caldwell & Drake v. Pierce, 154 Ky. 328, 157 S.W. 692; McMahon & Co. v. Casement & Co., 13 Ky. Law Rep. 429.

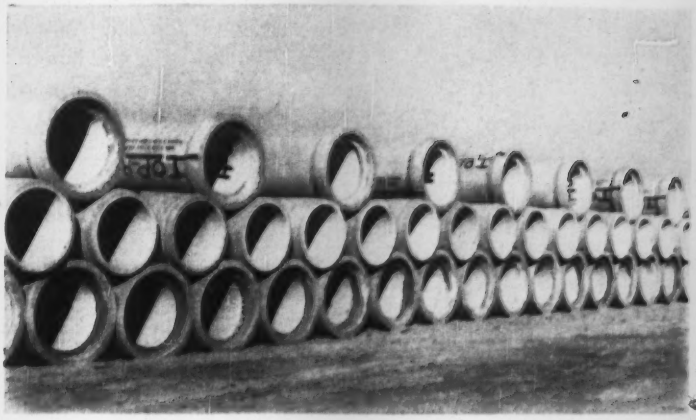
However, where the parties to the contract proceed throughout the performance of the contract without reference to the provisions in the contract, they may be held to have waived the provision for some one to decide what is extra work.

Meyer v. Berlandi, 53 Minn. 59, 54 N.W. 937, or where a contract makes the engineer's or architect's certificate conclusive on the parties, but one is not given by him before trial, his testimony as a witness will not be conclusive but will be received like the testimony of any other witness with equal knowledge and opportunity. Botcler v. Roy, 40 Mo. App. 234, 235; 54 A.L.R. 1266."[1]

(1) Green River Steel Corp. v. Globe Erection Co., 294 S.W. 2d 507.

These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.

A NEW CONCRETE PRESSURE PIPE *of unequalled* ECONOMY



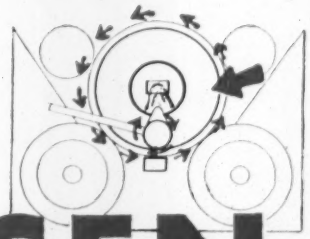
Recently, a large chemical company in Louisiana selected Cen-Vi-Ro Concrete Pressure Pipe to move fresh water into its new plant. Cen-Vi-Ro easily exceeded the hydrostatic and other test requirements, insuring the owners a permanent and maintenance-free installation. The close tolerances of Cen-Vi-Ro's precision-formed joints . . . measured in thousandths . . . combined with special O-ring type Rubber Gasket Seal assure perfect leak-proof connections under even the most adverse field conditions.

Lower first cost plus longer lengths result in a more economical installation . . . *every time!*

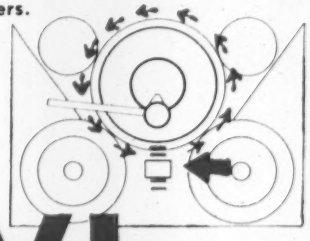
Write for complete Cen-Vi-Ro information . . .

THE NAME, ITSELF, *means* THE WORLD'S FINEST PIPE!

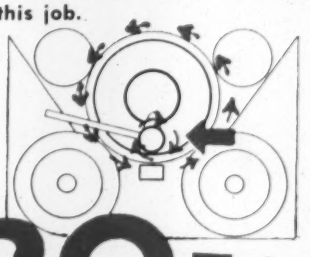
The Cen-Vi-Ro process is a combination of simultaneously *consolidating* and *pressurizing* a dry, zero-slump mix . . . to produce an extremely dense and impervious concrete with even distribution of the coarse aggregate and cement mortar.



CEN- comes from CENtrifugally spinning the very dry "earth-moist" mixture, fed into the form by belt conveyor in uniform layers.



VI- comes from VIbration of the spinning form during the charging period. Specially designed vibrator-tampers on the underside of the form do this job.



RO- comes from ROlling the mixture under great pressure applied by a specially designed steel roller.

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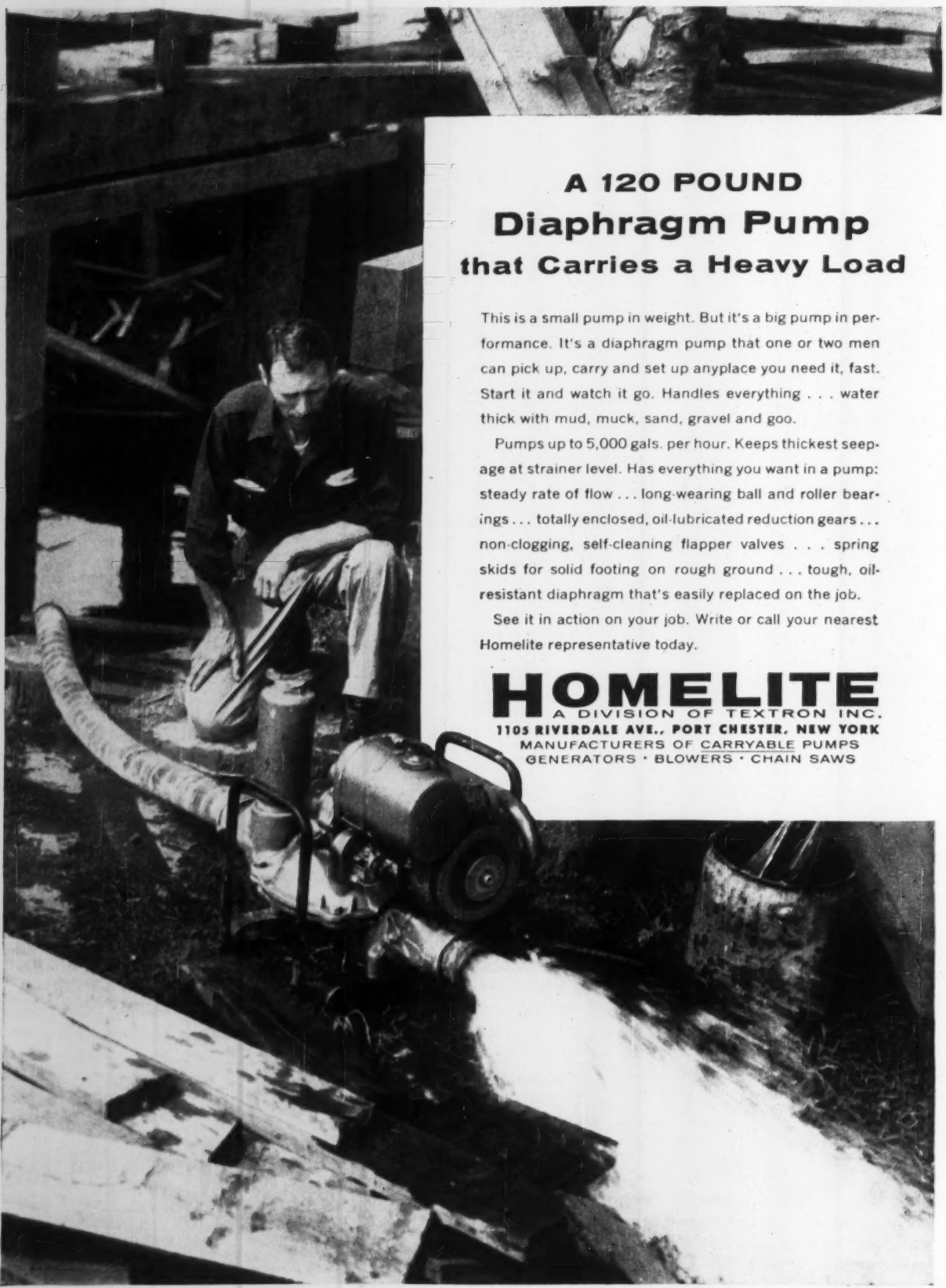

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Diaphragm Pump
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Pumps up to 5,000 gals. per hour. Keeps thickest seepage at strainer level. Has everything you want in a pump: steady rate of flow . . . long-wearing ball and roller bearings . . . totally enclosed, oil-lubricated reduction gears . . . non-clogging, self-cleaning flapper valves . . . spring skids for solid footing on rough ground . . . tough, oil-resistant diaphragm that's easily replaced on the job.

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Unit Prices

Louisiana Water Line With Stream Crossings

This $463,586 water line extension requires work at eight different locations in Terrebonne Parish, La.

The price covers 234,000 lin ft of cast iron pipe, 7,600 lin ft of galvanized iron pipe and 22,200 lin ft of stream, railroad and highway crossings. De Fraites Associates, Houma, La., are the consulting engineers for Terrebonne Parish Waterworks District in Houma.

A. C. Campbell Co., Shreveport, La., was successful against seven bidders with a price 6.4% below the engineer's estimate and 1.1% below the second low bid.

Prices for crossings range from $135 for a highway crossing, 30 ft long and 3 in. in diameter, to $12,000 for a bayou crossing 400 ft long and 6 in. in diameter. Cast iron pipe is priced from $1.00 for 2 in. to $2.50 for 6 in. pipe. Specifications call for class 150 pipe.

The eight sites are accessable by highway and water. The distances to the nearest railheads range from one to 16 miles.

Bidders include:

1C	A. C. Campbell Co., Shreveport, La	$463,586
2	E. N. Murray Const. Co., Buena Vista, Ga	468,731
8	Betpouey Jr. & Co., New Orleans, La	567,524
EE	De Fraites Associates, Houma, La	495,000

Bids: 1-17-57 Items	Unit	Quantity	Unit Prices 1C	 2
Schriever Route				
CIP, mech jt, 6"	lf	5,590	$2.50	$2.53
fittings, 6"	lb	435	0.35	0.34
4"	lf	489	1.76	1.83
fittings, 4"	lb	250	0.39	0.38
3"	lf	6,955	1.50	1.60
fittings, 3"	lb	345	0.45	0.42
2"	lf	22,500	1.00	1.01
fittings, 2"	lb	180	0.85	0.77
Gate vlv & box, mech jt, 6"	ea	1	91.64	85.00
4"	ea	3	68.82	63.00
3"	ea	6	58.03	52.00
2"	ea	5	40.70	49.00
Pipe, repair, 4" & larger	lf	600	0.25	0.20
3" & smaller	lf	450	0.25	0.15
Crossing, RR, 6"x30'	ea	1	370.50	360.00
4"x50'	ea	1	534.00	470.00
3"x50'	ea	1	451.00	470.00
hwy, 4"x30'	ea	1	150.00	125.00
3"x30'	ea	2	135.00	100.00
Coteau to Bayou Blue				
CIP, mech jt, 6"	lf	7,354	2.50	2.53
fittings, 6"	lb	295	0.35	0.34
2"	lf	1,500	1.00	1.10
Pipe, galv iron, 2"	lf	50	1.00	1.00
Gate vlv & box, mech jt, 6"	ea	4	91.64	85.00
Pipe, repair, 4" & larger	lf	250	0.25	0.20
3" & smaller	lf	200	0.25	0.15
Crossing, bayou, 6"x60'	ea	1	1,528	920.00
Bayou Blue				
CIP, mech jt, 6"	lf	17,850	2.50	2.53
fittings, 6"	lb	60	0.35	0.34
4"	lf	55,508	1.76	1.83
fittings, 4"	lb	470	0.39	0.38
3"	lf	15,954	1.50	1.60
fittings, 3"	lb	189	0.45	0.42
Pipe, galv iron, 2"	lf	4,304	0.94	1.00
Gate vlv & box, mech jt, 4"	ea	10	68.82	63.00
Pipe, repair, 4" & larger	lf	1,000	0.25	0.20
3" & smaller	lf	500	0.25	0.15
Crossing, hwy, 6"x40'	ea	1	240.00	190.00
bayou, 6"x400'	ea	1	12,000	11,000
4"x300'	ea	1	7,500	5,000
4"x100'	ea	1	1,772	1,350
Below Montegut				
CIP, mech jt, 4"	lf	23,650	1.76	1.83
fittings, 4"	lb	440	0.39	0.38
Gate vlv & box, mech jt, 4"	ea	8	68.82	63.00
3"	ea	1	58.03	52.00
Pipe, repair, 4" & larger	lf	1,000	0.25	0.20
Crossing, bayou, 4"x110'	ea	1	1,949	1,900
4"x150'	ea	1	3,000	2,000
Bayou Lacarpe				
CIP, mech jt, 6"	lf	2,250	2.50	2.53
fittings, 6"	lb	230	0.35	0.34
4"	lf	3,450	1.76	1.83
fittings, 4"	lb	768	0.39	0.38
3"	lf	2,130	1.50	1.60
fittings, 3"	lb	81	0.45	0.42
Pipe, galv iron, 2"	lf	2,600	0.94	1.00
Gate vlv & box, mech jt, 4"	ea	2	68.82	63.00
screw, 2"	ea	4	30.82	38.00
Pipe repair, 4" & larger	lf	300	0.25	0.20
3" & smaller	lf	200	0.25	0.15
Crossing, RR, 6"x30'	ea	1	370.50	360.00
hwy, 6"x40'	ea	1	240.00	190.00
3"x40'	ea	1	160.00	125.00
bayou, 4"x200'	ea	1	4,200	3,000
East Street				
CIP, mech jt, 6"	lf	3,450	2.50	2.53
fittings, 6"	lb	295	0.35	0.34
2"	lf	600	1.00	1.10
Gate vlv & box, mech, 6"	ea	1	91.64	85.00
screw, 2"	ea	1	30.82	38.00
Pipe, repair, 4" & larger	lf	100	0.25	0.20
Piling crossing, 2 bent, 4-15' piling	ea	1	250.00	200.00
Pointe Au Chien				
CIP, mech jt, 3"	lf	29,524	1.50	1.60
fittings, 3"	lb	298	0.45	0.42
Pipe, galv iron, 3"	lf	120	2.45	1.65
Gate vlv & box, mech jt, 3"	ea	4	58.03	52.00
Pipe, repair, 3" & smaller	lf	1,000	0.25	0.15
Crossing, bayou, 3"x120'	ea	1	1,360	1,100
Little Caillou—Below Boudreaux Canal				
CIP, mech jt, 4"	lf	34,435	1.76	1.83
fittings, 4"	lb	900	0.39	0.38
2"	lf	600	1.00	1.10
fittings, 2"	lb	35	0.85	0.77
Pipe, galv iron, 2"	lf	540	0.94	1.00
Gate vlv & box, mech jt, 4"	ea	3	68.82	63.00
2"	ea	1	40.20	40.00
screw, 2"	ea	1	30.82	38.00
Pipe, repair, 4" & larger	lf	792	0.25	0.20
Crossing, bayou, 4"x130'	ea	1	2,000	2,000
4"x100'	ea	1	2,000	1,350
2"x170'	ea	1	2,500	1,900

Time to complete: 200 calendar days
Liquidated damages: $100 per day

New Mexico Bridge Repair

Five bids ranged from $3,170 to $12,227 on repairs and the replacement of portions of damaged steel members in this 100 ft steel truss span. The contract to Allison & Haney, Albuquerque, N. M., tops the engineers' estimate by 70% but is 43% below the second low bid. Ralph A. Shubert, Raton, N. M., is consulting engineer for the New Mexico State Highway Department.

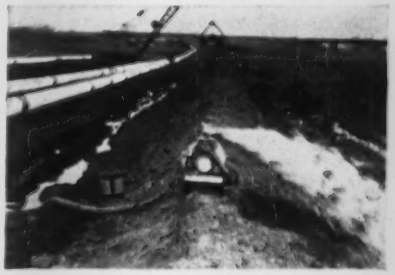
Minimum wage rates are $1.60 for common labor, $2.00 for semi-skilled and $2.50 for skilled labor.

1C	Allison & Haney, Albuquerque, N. M.	$3,170
2	Floyd Haake, Santa Fe, N. M.	5,581
5	James P. Johnson, Santa Fe, N. M.	12,227
EE	Ralph A. Shubert, Raton, N. M.	1,867

Bids: 3-22-57 Items	Unit	Quantity	Unit Prices 1C	 2
Structural steel	lb	1,595	$1.05	$1.00
Remove existing members	lb	3,322	0.45	1.20

Time to complete: 60 working days
Liquidated damages: $100 per day

Complete Line of Homelite Carryable Construction Equipment Now Available



Self-Priming Centrifugal Pumps . . . Carry these lightweight, dependable pumps anywhere. Non-clogging design . . . 28 foot suction lift . . . capacities up to 15,000 g.p.h. . . . sizes from 1½" to 3". Diaphragm pump also available.

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.

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Materials and Labor Prices — Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Apr 18; Next, May 23
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Apr 25; Next, May 30
- Wage Rates, Building Board, Lath, Insulation: Last, May 2; Next May 30
- Cement, Aggregate, Ready-Mixed Concrete, Asphalt: Last, May 9, Next, June 6

IRON AND STEEL PRODUCTS — PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES	PLATE CARBON STEEL	REINF BARS billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.00	$4.85	$5.075	$10.85		$101.50	$120.00	$6.35	$8.775	$6.025	.....
Chicago Area	5.00	4.85	5.075	10.85	$5.90	101.50	120.00	6.35	8.775	6.025	.....
Pittsburgh Area	5.00	4.85	5.075	10.85	5.90	101.50	120.00	6.35	8.775	6.025	$13.10
Buffalo Area	5.00	4.85	5.075	10.85	5.90	101.50	120.00	6.35	8.775	6.025	13.10
Cleveland	.....	.....	5.075	10.85	5.90	.....	.....	.....	.....	.....	13.10
Youngstown Area	.....	.....	5.075	.....	.....	.....	.....	.....	8.775	.....	.....
Geneva	5.00	4.85	5.175	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	5.70	.....	5.775	.....	5.90	.....	.....	.....	8.775	.....	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	6.35	8.775	6.025	.....

IRON AND STEEL PRODUCTS — F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	EXPANDED METAL LATH Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$8.44	8.90	$8.08‡	$52.00	$57.00	
Baltimore	8.67	8.10‡		42.00	46.50	
Birmingham	8.20‡	8.07‡	8.07‡	66.25p	71.00p	
Boston	9.10a	8.15	8.15	47.50	51.00	
Chicago	8.35	6.81gu	6.81gu	52.00‡	63.00‡	
Cincinnati	8.89ak	8.43rs		43.50mn	48.00mn	
Cleveland	8.57	6.54c		43.50‡	48.00‡	
Dallas	9.95	8.50	8.50	57.00	62.00	
Denver	9.80	8.45c		57.00n	63.00n	
Detroit	8.74	8.13		56.00	63.00	
Kansas City	8.87a	7.65		48.00	52.50	
Los Angeles	9.00fd	7.35		58.50	64.50	
Minneapolis	8.64d	8.91b	8.91b	41.50	46.00	
Montreal	8.25–900C/8.30–8.70A	7.75/9.95s	7.75/9.95s	65.70hA	70.20hA	
New Orleans		7.70aks		45.50	50.00	
New York	8.91s	7.80dy	7.80dy	50.50n	57.00no	
Philadelphia	8.04	7.14		42.50‡	47.00‡	
Pittsburgh	7.48	6.57		42.50	47.00	
St. Louis	8.67s	8.05c	8.05c	60.00l	62.00l	
San Francisco	9.15	9.10g		47.50	53.00	
Seattle	9.35	8.60r		62.00nr	68.00nr	
Toronto	8.75*	7.60	7.60	56.00mq	59.00mq	

EXTRAS, per cwt: under 100#, +$1.80; 100–199#, +$1.50; 200–499#, +$1.20; 500–999#, +90¢; 1000–1999#, +60¢; 2000–2999#, +30¢; 3000–39,999#, +10¢; 40,000# & up, none. ◆Size #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70¢; #6, #7, #8, #9, #10, #11 +50¢. ◆Bending: heavy, Chicago, New York City and surrounding metropolitan area where bending must be done on the job, ◆Engineering details and placing from design by others: over 500 tons, +45¢; 200–499 tons, +50¢ but not over $4,500; 75–199 tons, +65¢ but not over $3,000; 20–74 tons, +75¢ but not over $375; 5–19 tons, +85¢ but not over $300; under 5 tons, +$1.00 but not over $85, min. charge $25 for drawing. ‡Resign only: +60¢.

Quantity extras, per cwt: under 100#, +$9; 100–399#, +$6; 400–999#, +$3.50; 1000–1999#, +1.00; 2000–4999#, base price; 5,000–9999#, —10¢; 10,000–19,999#, —30¢; 20,000–29,999#, —50¢; 30,000# and up, —70¢

WELDED FABRIC REINFORCING — Per 100 sq ft., carload lots fob mill

4 × 16 in., No. 8 & 10 wires — Joliet, Ill., Donora, Pa., Monessen, Pa.	$3.78
4 × 12 in., No. 8 & 12 wires — Joliet, Ill., Donora, Pa., Monessen, Pa.	$3.50
6 × 6 in., No. 6 & 6 wires — Joliet, Ill., Donora, Pa., Monessen, Pa.	$3.95

*‡ Delivered *a 2000–9999# *b 10,000–19,999#, fob city *c 20 tons or over *d 10,000–19,999# *e Intermediate struct'l *f Incl. delivering in free zone *g CL *h list price; dominion tax exempt; add provincial and municipal taxes *i add dominion, provincial and municipal sales taxes *j Intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m copper alloy *n LCL *o asphalt coated *p del. of 500 sq. yd. or more. *q 3 lb *r 2% off for cash *s 2,000–4,999# *t add 15¢ del. *u add 8.25¢ switch *v incl 15¢ del. *x add 5¢ switch *y add 35¢ del. *z add 10¢ del. *A American made. *C Canadian made. *• Aver. of Canadian & American.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEXa	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 8' Pr Cl. 150	ASBESTOS CEMENT PIPE 12' Sew Cl. 1	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	36 in. ds.	CLAY DRAIN TILE ASTM C4-24 PER 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14-41 12 in.	24 in.
Atlanta	123.7	$1.64	$2.68	$.58	$1.00	$4.40	$14.50	$277.00s		$1.55m	$4.40m
Baltimore	133.3	1.64	2.46	665	1.28	5.08s	12.71	187.80	$289.20	1.01	2.75m
Birmingham	119.0	1.64	2.68	46	86	3.70w	10.37w	260.00‡	440.00‡	1.25m	2.75
Boston	136.2	1.66	2.46	812qrt	1.566qrt	6.525qrt		215.40r	330.60r	1.56mq	3.47mq
Chicago	134.1	1.64	2.46	93m	1.78m	7.52m	21.16m	220.00n	330.00n	1.30	4.00
Cincinnati	128.7	1.66	2.55	665t	1.282St	4.905t	12.505	240.00	370.00	.85m	3.25m
Cleveland	134.9	1.66	2.55	595s	1.2015s	4.725t	12.4025t	155.40m	240.60m	.85m	3.50m
Dallas	131.0	1.66	2.80	439	799	4.00b	9.17b		••	.63	1.86
Denver	141.4	1.73	2.80	47n	84n	3.73n			••	.75m	2.75m
Detroit	135.3	1.66	2.55	90	1.70	6.80	18.50	240.00m	370.00m	.95	3.82
Kansas City	131.7	1.66	2.55	61	1.105	5.518	14.95	275.00	485.00	.90	2.90
Los Angeles	141.8	1.73	2.46	74l	1.61l	6.42l	15.36l	360.00l	530.00l	1.12	3.32f
Minneapolis	143.1	1.68	2.68	86mo	1.55mo	6.70mo				1.76hA	4.74hA
Montreal				1.07u	1.90u	6.80u	12.50u			1.17h	3.11y
New Orleans	126.5	1.64	2.68	535	93	5.44		370.00p	580.00p	.85	2.90
New York	131.7	1.66	2.46	1.02	1.94	7.56	19.48			1.50	3.00
Philadelphia	131.0	1.64	2.46	65	1.25	4.95s	12.65s	300.00‡	350.00‡	1.60hA	3.95hA
Pittsburgh	136.1	1.66	2.46	468m	.864m	3.86m	9.78m	152.00	244.00	1.05hA	2.50hA
St. Louis	130.1	1.64	2.55	59	1.08	4.45	10.80	180.00l	380.00l	1.45il	3.10il
San Francisco	141.8	1.73	2.46	78d	1.69d	6.72d	16.36d	320.00l	560.00l	1.05m	3.30m
Seattle	142.2	1.73	2.46	67b	1.33b	6.84		220.00c		1.10k	3.25k
Toronto				76	1.42S	6.00		157.00	280.00	1.02	3.87

*‡ Delivered. *a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 119.0; Burlington, N. J., 127.8. *b Extra strength ASTM C 200–44T *c 4-in., $130. *d SS361-A *e 30-in. *f 21 in. *g culvert pipe; reinforced, ASTM C 75-56 *h reinforced, ASTM C 75-41 *i reinforced, ASTM C 76-37 *j centrispun; no standard specs. in Canada *k 2% off for cash *l fob plant *m truck delivery *n LCL delivered, fob truck *o listed price based on LCL (no min.) *p freight allowed to destination in city *q ASTM C 13-40 *r CL fob origin, freight allowed *s 2 ft lengths *t 3 ft lengths *u CESA A 60-1941 specs. used *v standard strength *w ss; add 20% for d.s.

*WROUGHT STEEL PIPE

(Full standard weight)

Discount from list; see footnotes

Mill	2½ to 6 in., Butt Weld, Black %	2½ to 6 in., Butt Weld, Galv. %	2½ & 3 in., Lap Weld, Black %	2½ & 3 in., Lap Weld, Galv. %	3½ to 4 in., Lap Weld, Black %	3½ to 4 in., Lap Weld, Galv. %	4½ to 6 in., Lap Weld, Black %	4½ to 6 in., Lap Weld, Galv. %
Lorain, Ohio	20 75	2 50	20 75	2 50	10 25d	+4 00g	+5 50	+8 50
Alquippa, Pa	20 75	2 50	20 75	2 50	4 25d	+14 50	+5 75d	+8 50d
Sparrows Pt., Md.	18 75	0 50	20 75	2 50	9 25d	+9 50g	+2 75d	+6 50d
Benwood, W. Va			20 75	2 50	13 50d	+0 75d	+21 50d	+21 50d
Youngstown, O			20 75	2 50	10 25	+8 50d		
Indiana Harbor, Ind.			19 75	1 50	9 25d	+9 50g		
Sharon, Pa.			20 75	2 50	10 25d	+8 50g	+5 50	+8 50
Wheatland, Pa			20 75	2 50	10 25d	+8 50d	+5 75d	+8 50d
Etna, Pa			20 75	2 00	8 50d	+5 75d	+2 75d	+6 50d
Fontana, Calif.			7 75	+10 50	+2 75d	+21 50d	+21 50d	+21 50d

+Threaded and coupled. a 3½ to 4 in. b Continuous weld. 5 and 6 in. d 6 in.

* **WROUGHT STEEL PIPE:** Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft.(*based on approx. $200 per net ton): Butt Weld ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight rates plus 3% transportation tax to get destination price.

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 65.54, galv., + 95.77; 1¼ in. black, + 65.54, galv. + 95.23, 1½ in. black, + 61.79 galv. + 91.22; Lap Weld—2½ in. to 3 in. black + 67.95 galv. + 95 77; 4½ in. to 6 in. black + 64.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

ANOTHER SOCONY MOBIL FIRST FOR CONTRACTORS

NEW PRACTICAL PM SYSTEM

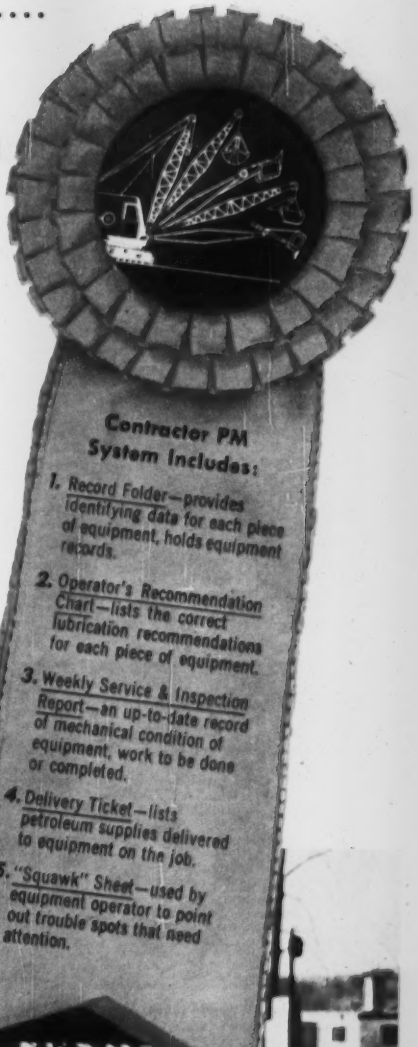
Helps prevent equipment troubles— cut delays!

Socony Mobil's new, simplified PM system for contractors is especially designed to help keep equipment in top working order with a minimum of paper work. This practical program can help prevent breakdowns—caused by lack of lubrication care—that cost time and money. It's an important part of Socony Mobil's Correct Lubrication Program which also includes:

Famous Quality Products such as Delvac Oils, New Mobilube GX Multipurpose-type Gear Lubricant, Mobilgrease.

Lubrication Engineering Service covering analysis, advice and use of Socony Mobil's outstanding technical know-how.

Ask your Socony Mobil representative to show you how this ingenious new system can help you.



Contractor PM System Includes:

1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
2. Operator's Recommendation Chart—lists the correct lubrication recommendations for each piece of equipment.
3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

SOCONY MOBIL *Leader in lubrication for over 91 years* Mobil *Correct Lubrication*

A PROVED PROGRAM TO REDUCE EQUIPMENT MAINTENANCE COSTS

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Mass., Springfield—BA 5/22—City, Dpt. Streets & Eng., City Hall, prestressed concrete bridge, Mill River at Hancock St. $100,000. Plans deposit $20, refundable. Tekton Associ, Inc., 23 Washington St., Natick, engr. CD 1/14.

▲† **Mass., Falmouth**—HOUSING—BA 5/24—U. S. Eng., 150 Causeway St., Boston, 200 unit family housing, at Otis Air Force Base, ENG-19-016-57-209. $2,900,000-$3,000,000. Plans deposit $25. Architects Collaborative, 63 Brattle St., Cambridge, archts. CD 4/30.

† **N. H., New Castle**—BA 5/24—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass. paving, Naval and Marine Corps Reserve Training Center, Camp Langdon, NBy-12777, Spec. 12777/57.

† **Me., Brunswick**—NAVAL AIR STATION—BA 5/26—First Naval Dist., 495 Summer St., Boston, Mass., A.U.W. Bldg., Naval Air Station. Over $73,000. Plans deposit $50, refundable. Extended date. Thomas Worcester, Inc., 85 State St., Boston, Mass., engr. CD 5/3.

† **Mass., Falmouth**—HOT WATER DISTRIBUTION SYS.—BA On Or About 5/27—U. S. Eng., 150 Causeway St., Boston, high temperature hot water distr. sys., Otis Air Force Base, ENG-19-016-57-212. $800,000-$1,000,000. Plans deposit $15. CD 8/24.

BUILDINGS—BA

▲ **Mass., Quincy**—SCHOOL—BA 5/22—City, Comm. P. Wks., City Hall Annex, Atlantic Junior High School, Hollis Ave. $1,850,000. Plans deposit $100. Korsfund; LeNormand & Quann, Inc., 506 Washington St., Norwood, archts. CD 4/11/56.

† **Vt., North Concord**—RECREATION, etc.—BA On Or About 5/28—U. S. Eng., 150 Causeway St., Boston 14, Mass., recreation bldg., existing transmitter bldg. addn., receiver bldg. and correction of deficiencies in existing operations bldg., existing power bldg., North Concord Air Force Station, ENG-19-016-57-211. $200,000.

▲ **R. I., Exeter**—EDUCATIONAL, etc.—BA 6/3—State R. I. & Prov. Plants, Div. Purchases, State House, Bids 982—3-4 and 5, Proj. EXE 4, educational and recreational bldg., R. I. State School. $1,000,000. Plans deposit $25. Creer, Kent, Cruise & Aldrich, 423 Industrial Bank Bldg., Providence, archts. CD 4/2.

N. H., **Rochester**—TRAINING CENTER—BA 6/4—U. S. Eng., 150 Causeway St., Boston, Mass., army reserve training center, ENG-19-016-57-138. $200,000-$300,000. Plans deposit $10. Extended date. Tracy & Hildreth, 4 Davis Court, Nashua, archts. CD 5/6.

BUILDINGS—SLC

Conn., **Brookfield Center**—SCHOOL—St. Joseph's Roman Catholic Church, Brookfield Center, soon lets contract 2 story, brick, stone parochial school. $350,000. J. Gerald Phelan, 211 State St., Bridgeport, archt. Fletcher-Thompson, Inc., 211 State St., Bridgeport, engr.

▲ **Conn., New Haven**—OFFICE EXCAVATION—Southern New England Telephone Co., 227 Church St., soon lets contract excavation for office bldg. Total est. $10,-000,000. Douglas Orr, 111 Whitney Ave., archt. Meyer, Strong & Jones, 101 Park Ave., New York, N. Y., engrs. CD 11/14.

▲ **Conn., New Haven**—LABORATORY—Yale University, c/o Charles S. Gage, treas., 119 College St., soon lets contract 5 story, penthouse, 71x112 ft., masonry, concrete electrical engineering laboratory, Hillhouse Ave. $1,000,000. Carl R. Blanchard, 111 Whitney Ave., archt. Douglas Orr, 111 Whitney Ave., New Haven, engr. CD 7/24.

HEAVY CONSTRUCTION—LB & CA

† **G. H. Manning**, 14 Aklen Rd., Brewer, Me., LB $238,-700, est. $240,800, base storage warehouse, Dow Air Force Base, ENG-19-016-57-196, BANGOR, ME. U. S. Eng., 150 Causeway St., Boston, Mass. CD 4/12.

† **Great Lakes Dredge & Dock Co.**, 17 Battery Pl., New York, N. Y., LB Alt. 1-$134,316, est. $146,328, Alt. 2-$240,464, est. $237,272, (1 bidder), dredging Fore River, Portland Harbor, CIVENG-19-016-57-78, PORTLAND HARBOR, ME. U. S. Eng., 150 Causeway St., Boston, Mass. CD 4/17.

▲ **NEW HAMPSHIRE**—Dpt. P. Wks. & Hys., Concord, Bids opened 5/3.

N. H.—**Peter Salvucci & Sons, Inc.**, 55 Pond St., Waltham, Mass., LB $1,076,441 (7 bidders) road mix hy. 2.481 mi. N. H. 9, Keene-Roxbury;

N. H.—**R. G. Watkins & Son, Inc.**, Mill yard, Amesbudy, Mass., LB $295,745 (8 bidders) surf. tr. grav. 2.235 mi. N. H. 111, Atkinson-Hampstead. CD 4/24.

▲† **Perini Corp.**, 73 Montwaite Ave., Framingham, Mass., CA $1,367,351, est. $1,251,538, relocations Hys. 30 and 8, CIVENG-19-016-57-65, VERMONT U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 3. CD 4/5, under LB.

† **Gil Wyner Co., Inc.**, 12 Newland St., Malden, Mass., LB $281,190, est. $296,677, north Springfield Dam, Black River, North Springfield, CIVENG-19-016-57-83, VERMONT. U. S. Eng., 150 Causeway St., Boston, Mass. Bids May 1. CD 4/10.

Joseph DeFilippo Co., Inc., 132 Milton St., Dedham, Mass. CA $75,000, particular sewers, DEDHAM, MASS. Town Bd. Selectmen, Town Hall, Dedham, Mass. CD 4/23.

J. Andreassi & Co., 52 Charme Ave., Roslindale, Mass., LB $183,663, est. $200,000. Contr. 33, sewer constr. WEYMOUTH, MASS., Town, Bd. Sewer Comrs., Sewer Dpt., 402 Essex St., Weymouth, Mass. CD 4/26.

RHODE ISLAND—State R. I. & Prov. Plants Div. Purchase, State House, Providence,

Tower Iron Works, Inc., 50 Borden St., Providence, R. I. LB $187,095, est. $200,000. Pawtucket Bridges 551 and 555, incl. structural steel superstructures 5 bridges, Bid No. 938, Contr. 5752 R. I. F.A.P. 1-01-(11), Pawtucket. Bids May 1. CD 4/23.

▲ **RHODE ISLAND**—State R. I. & Prov. Plants, Div. Purchase, State House, Providence,

Campanalli & Cardi Constr. Co., 780 Jefferson Blvd. Warwick, R. I., CA $1,019,120, Louisquisset Pike urban exten. Branch Ave. to Olney Pond, R. I. Cont. 4702, F.A. Proj. F-035 (5) North Providence and Lincoln. Bids Apr. 24, CD 4/29, under LB.

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford, Bids opened 5/6,

L. G. **DeFelice & Sons, Inc.**, Nettleton Ave., North Haven, Conn., LB $2,324,529 (8 bidders) Proj. 36-73, 11,622 lin. ft. dual lane c. conc., Shelton-Derby-Ansonia Expressway, incl. rein.-con. and rolled beam composite bridge, etc., Relocation of Route 8, Ansonia, Derby and Seymour. CD 4/19.

† **New England Dredge & Dock Co.**, 60 S. Water St., New Haven, Conn., LB $518,700. Item No. 1; $212,940, Item No. 2; maintenance dredging entrance channel in West River, New Haven Harbor, CIVENG-19-016-57-86, CONNECTICUT. U. S. Eng., 150 Causeway St., Boston, Mass. Bids May 1. CD 4/24.

Rosa & Todisco Constr. Co., 20 Shaw St., Roxbury, Mass., LB $208,718 (6 bidders) sanitary and storm sewers 1.8 mi. King's Hy. area between Black Rock Turnpike and Jennings Rd. and May St. area, FAIRFIELD, CONN. Town, Town Hall, Fairfield, Conn. Bids Apr. 29. CD 4/24.

Lind-McLeod, Inc., 1780 Stratford Ave., Stratford, Conn., LB $139,604 (9 bidders) sanitary and storm sewers 1.7 mi. Castle Ave. and streets between Jennings Rd. and Black Rock Turnpike also Kings Hy. and Benton St. (Fairfield, Conn.).

R. S. **Noonan Inc.**, 26 N. Duke St., York, Pa., CA $613,800. DORMITORY "A" and CENTRAL HALL "B" MONTEPELIER, VT. Vermont Junior College, College Ave., Montepelier, Vt. Bids Mar. 19. CD 3/27, under LB.

Mauro Constr. Co., 62 Bassett St., New Haven, Conn., LB $604,000 (8 bidders) Proj. MR 62, moderate rental HOUSING, DERBY, CONN. Derby Housing Auth., Town Hall, Derby, Conn. Bids Apr. 23. CD 4/10.

North Methodist Church, 447 N. Main St., Manchester, Conn., rejected bids Apr. 25, EDUCATIONAL and ADMINISTRATION BLDGS., CHAPEL, MANCHESTER, CONN. $345,000. CD 4/24.

New England General Contg. Co., 341 State St., New Haven, Conn., CA $225,000. 1 story, 22,500 sq. ft. WAREHOUSE, 1597 State St., NEW HAVEN, CONN. Horton-Gallo-Creamer Co., 96 State St., New Haven, Conn. Walter Crabtree Jr., 195 Fern St., West Hartford, Conn., archt. Awarded May 2.

BUILDINGS—LB & CA

E. L. Paterson & Son, 1808 Islington St., Portsmouth, N. H., LB $100,000. FACTORY addn., McDonough St., KEENE, N. H. Continental Shore Corp., McDonough St., Portsmouth, N. H. Maurice E. Witner, 3 Hillside Dr., Portsmouth, N. H., archt.

Davison Constr. Co., 1306A Elm St., Manchester, N. H., CA Est. Approx $350,000. CLUB HOUSE, Union St., MANCHESTER, N. H. Manchester Boy's Club, 487 Beech St., Manchester, N. H. Kochler & Isaak, 1880 Elm St., Manchester, N. H., archts.

McCutcheon Co., 250 Stuart St., Boston, Mass., CA Approx. $500,000. DORMITORY, Ada Comstock Hall, CAMBRIDGE, MASS. Radcliffe College, Admin. Office, 10 Garden St., Cambridge, Mass. Maginnis & Walsh & Kennedy, 126 Newbury St., Boston, Mass., archts. CD 8/3.

Enright Brothers, Woburn, Mass., CA Approx. $360,000. RESIDENTIAL DEVELOPMENT, 20 houses, "Crestview", Rte. 110, CHELMSFORD, MASS. Owner, c/o Belford Assocs., 321 Woburn St., Lexington, Mass.

C. Larusso, 629 South St., Franklin, Mass., CA Approx. $350,000. RESIDENTIAL DEVELOPMENT, 31 houses "Country View", Rte. 140 FRANKLIN, MASS. Owner, c/o A. J. Skene, 477 Washington St., Norwood, Mass.

George Picard, 46 Ursula St., Lowell, Mass., CA Approx. $350,000. SALESROOM, STORAGE BLDG., Appleton St., LOWELL, MASS. Norcross & Leighton, Inc., 40 Middle St., Lowell, Mass. Arthur England, 97 Central St., Lowell, Mass.

▲ **John J. Bennett**, Reynolds Dr., Wallingford, Conn. Owner Builds. $1,280,000. 128 HOUSES, "Pond Hill Estates", WALLINGFORD, CONN.

▲ **John Zandonella, Inc.**, 70 Chase St., Bridgeport, Conn., CA $3,114,000. HIGH SCHOOL, North Ave., WESTPORT, CONN. Town School Bldg. Comm., Jessup Rd., Westport, Conn. Bids Apr. 8. CD 4/16, under LB.

Bessoni Bros., 274 Lawler Rd., New Britain, Conn., CA Approx. $350,000. 28,000 sq. ft. SHOPPING CENTER, for Mott Stores, WILSON, CONN. General Wholesale Grocery Co., 59 Leggett St., East Hartford, Conn. Bids Mar. 11, awarded Apr. 30. CD 2/26.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

Pa., Phila.—DISTRIBUTION SYSTEM ADDNS.—BA 5/20—City, Dpt. Procurement, City Hall Annex, Phila., Pa., Bid 6588, Contr. No. A-142-NE, existing underground power and communications distr. sys. addns. and modifications in area north of "T" hangar Unit "A", North Philadelphia Airport. CD 3/9/56.

† **N. Y., Mattydale**—SECURITY FENCE—BA 5/21—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y., security fence (around) Building No. 814 U. S. Marine Corps Reserve Training Center, NBy-11971, Spec. 11971/57.

† **D. C., Wash.**—SPRINKLERS—BA 5/22—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., installing sprinklers, Bldgs. 4 and 19, Naval Security Station, NBy-8372.

(Continued on page 124)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**

PROPOSED WORK

Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

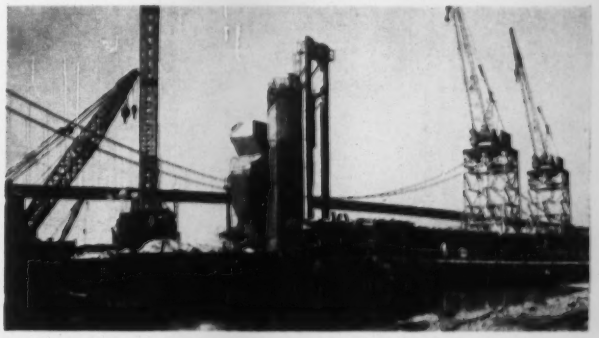
Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

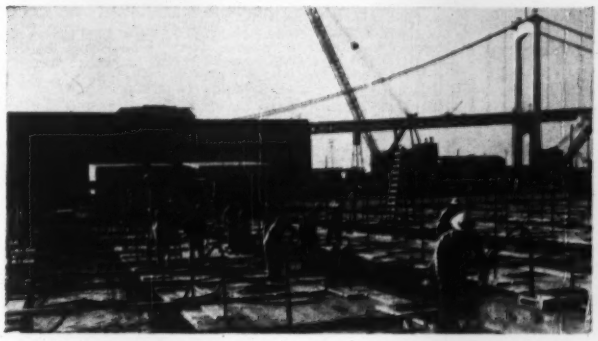
How world's largest underwater concrete placement was made at Camden drydock

Building one of the world's largest drydocks at the New York Shipbuilding Corp., Camden, New Jersey, required the underwater placement of a 134,200-cu. yd. Prepakt concrete floor slab. Here's how this unprecedented placement was made:

First move was direct placement of coarse aggregate from bottom-dump barges inside cellular sheetpile cofferdam. Barges arrived via Delaware River (rear).



Next, Intrusion grout was batched, mixed, pumped from Prepakt plant. I-P methods made possible economical construction of a gravity floor slab, avoiding costly hydrostatic relief of structure.



Underwater consolidation of aggregate was done from rafts. Live grout face was maintained throughout continuous six-week grouting operation.

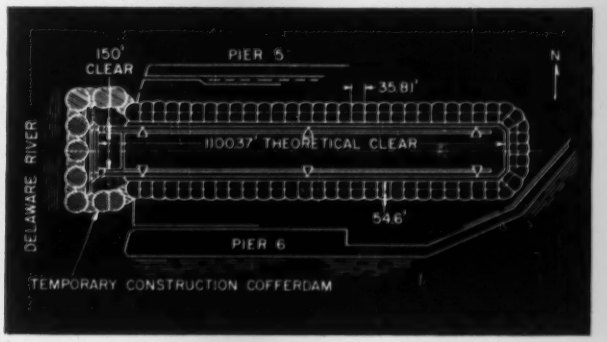


Diagram shows dimensions and location of drydock. Unreinforced Prepakt concrete slab is 17 to 25 feet thick.

Contractor: Merritt-Chapman & Scott Corp.

Consulting Engineers: Parsons, Brinckerhoff, Hall & Macdonald

With grouting completed, slab was cured for 30 days. Dewatering later revealed a monolithic slab—a firm base for new Forrestal-class carriers.

Intrusion-Prepakt, Inc., Room 568, Union Commerce Bldg., Cleveland 14, Ohio. In Canada: Intrusion-Prepakt, Ltd., 159 Bay Street, Toronto, Ontario.

INTRUSION-PREPAKT, INC.

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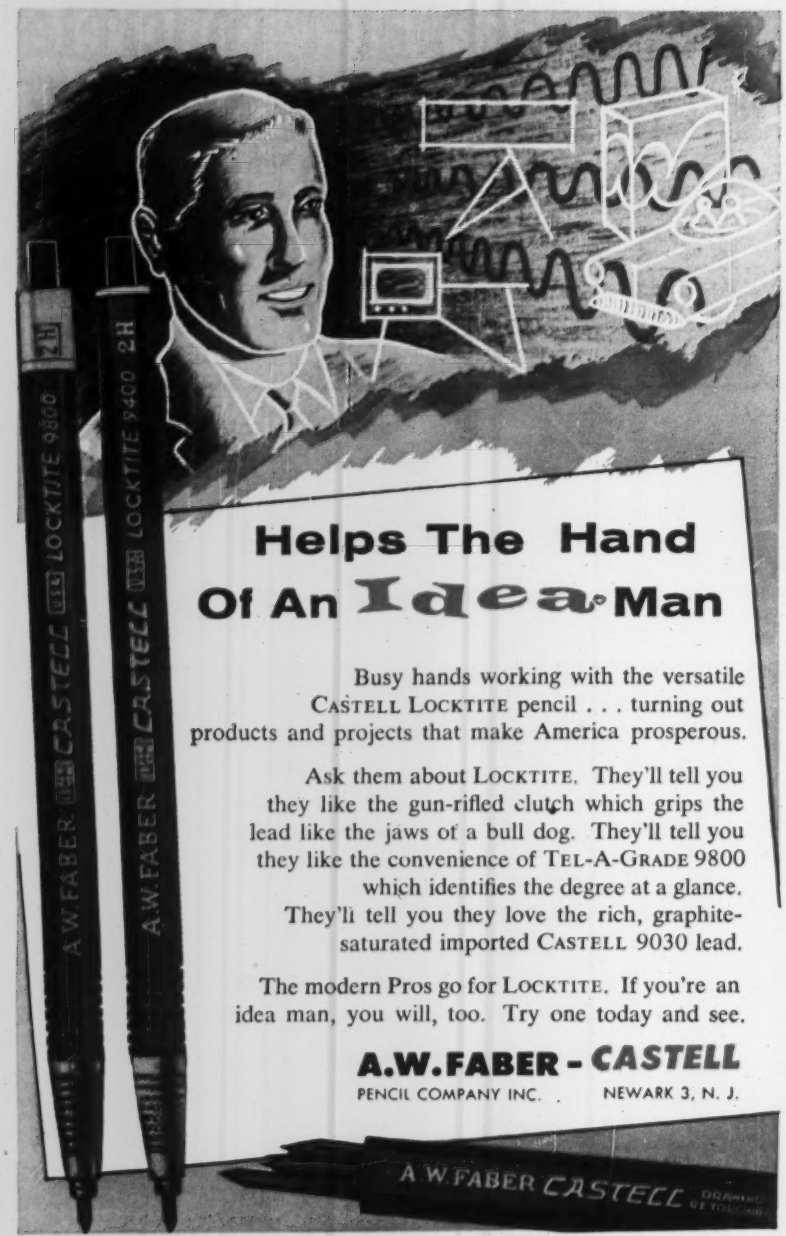

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(Continued from page 122)

† **New York and New Jersey**—EMERGENCY POWER—BA 5/29—U. S. Eng., 111 E. 16 St., New York 3, N. Y., electrical emergency power at Saratoga, Lockport and Watertown, N. Y. and Highlands, N. J., ENG-03-075-57-372. $500,000-$700,000. Extended date. CD 5/2.

† **N. J., Jersey City**—SEEDING, etc.—BA 5/23—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y., seeding and minor bulkhead repairs, U. S. Naval Reserve Training Center, NBy-8287, Spec. 8287/57.

† **N. Y., Niagara Falls**—BOILER HOUSE—BA 5/23—Dist. P. Wks. Office, Third Naval Dist., Fed. Office Bldg., 90 Church St., New York 7, N. Y. boiler house, U. S. Naval Air Station, NBy-8290, Spec. 8290/57. Plans deposit $40.

Pa., Phila.—PLAYGROUNDS—BA 5/27—Dpt. Recreation, City, City Hall Annex, Bid. 5405, general constr.; Bid 5406, plumbing work, Bid 5428, heating, Bid. 5407, electrical work, Bid 5408, landscape work at Tacony Park, Torresdale and Cottmans Sts.; Bid 5417, general constr., Bid 5418, plumbing work, Bid 5429, heating work, Bids 5419, electrical work, Bid 5420, landscape work at playground, Ditman and Decatur Sts. CD 9/7.

N. Y., Rochester—BA 5/31—Fred W. Ereth, City Purch., Agt., City Hall, 20 South Fitzhugh St., sewage force main and pumping station for Tryon Park Area, Contract A-1, connecting sewers and sewage force main, Contract A-2, general construction; Contract A-3, heating and ventilating; Contract A-4, plumbing; Contract A-5, electric wiring for sewage pumping station. Plans deposit $30. Havens & Emerson, Woolworth Bldg., 233 Broadway, New York, engrs.; adv. ENR 5/16. CD 3/20/56.

Pa., New Castle—BA 6/3—At office Jack H. Fritz, city clk., City Bldg., First and Second Ward Relief Sanitary Sewers. Plans deposit $10; adv. ENR 5/16. CD 2/21/56.

† **N. Y., Niagara Falls**—READY FIGHTER SHELTERS—BA On Or About 6/4—U. S. Eng., 111 E. 16 St., New York, Zone 3, fabrication, erecting ready fighter A/C shelters, Niagara Falls Air Force Base, Serial No. ENG-30-075-57-317, $400,000-$500,000. CD 11/1.

N. J. Millville—BA 6/4—City, City Hall, $590,000. sewage treatment facilities, addns., imprvs. Plans deposit $50. Maxwell C. Barber, City Hall, city engr. Albert C. Jones Associates, 223 High St., Mount Holly, consult. engrs.; adv. ENR 5/16.

N. J., Port Newark—STRUCTURAL STEEL—BA 6/4—The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., Contract PN-420.004, furnishing, erecting structural steel for Buildings No. 191, 192, 193 and 194. Plans deposit $30. CD 12/2/55.

† **New York and New Jersey**—AAA FACILITIES—BA On Or About 6/6—U. S. Eng., 11 E. 16 St., New York 3, N. Y., special AAA facilities AN/TPS, antenna pads, various sites incl. Sch. 1, Fort Hancock, N. J., South Amboy, N. J., Morristown, N. J., Orangeburg, N. Y. and Kensico, N. Y., CD 7/19/55; Sch II, Cambria, N. Y., Grand Island, N. Y. and Millersport, N. Y., ENG-30-075-57-381. Est. $25,000-$50,000. CD 6/14/55.

† **N. Y., Rome**—STORAGE—BA On Or About 6/6—U. S. Eng., 111 E. 16 St., New York, Zone 3, open bulk storage (FY55) Griffiss Air Force Base, Serial No. ENG-30-075-57-493, $300,000-$400,000. CD 2/29/56.

BUILDINGS—BA

† **D. C., Wash.**—EXHIBITS—BA 5/24—General Services Admin., 19 and F Sts. N.W., modernization of exhibits, Natural History Bldgs., Halls 14 and 15, Smithsonian Institution. CD 3/23/56.

N. Y., New York—RECREATION HALL, etc.—BA 5/28—Archdiocesean Bldg. Comn., 451 Madison Ave., Zone 22, recreation hall and chapel at Mother Cabrini High School for Missionary Sisters of Sacred Heart, $750,000. Desina & Pellegrino, 140 Cedar St., Zone 6, archts. CD 8/10.

▲ **Pa., Phila.**—PATIENTS, etc.—BA 5/28—Penna. Hospital, 111 N. 49 St., patients' bldg. and occupational therapy bldg. $2,850,000. Martin Stewart & Noble, 117 S. 17 St., archts. Allabach & Renis, Inc., 1 S. Broad St., engr. CD 5/26/56.

▲† **N. J., Trenton**—BLOWER BUILDING—BA 6/18—Dpt. Navy, Phila. Naval Base, Phila., Pa., ram blower building exten. and altitude test chamber, Naval Air Turbine Test Station, NBy-11554. $8,000,000. Kelly, Cruzen & McConathy and Hoffman & Assocs., 60 Park Pl., Newark, N. J., engrs.-archts. CD 1/15/54.

N. J., Hackensack—COURT HOUSE WING, etc.—BA 6/26—Bd. Freeholders Bergen Co., Administrative Bldg., court house wing, administrative bldg. alterations, addns., incl. Contract No. 1, general construction work; Contract No. 2, structural steel and misc. iron; Contract No. 3, elevators; Contract No. 4, plumbing work; Contract No. 5, heating, ventilating and air conditioning work; Contract No. 6, electrical work. Plans deposit $100. York & Sawyer, 101 Park Ave., New York 17, N. Y., archts.; adv. ENR 5/16. CD 3/30/56.

Pa., Birdsboro—FOUNDRY—Bids Asked—Birdsboro Steel Foundry & Machine Co., Birdsboro, foundry addn. $250,000. Carl A. Eisenhower, 510 Walnut St., Reading, archt.

HEAVY CONSTRUCTION—SLC

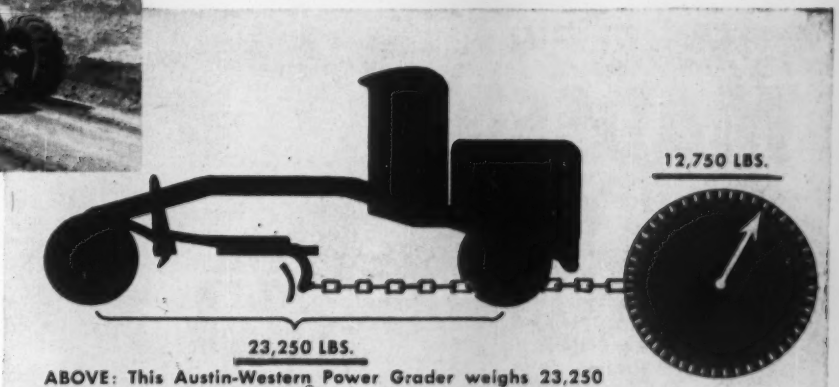
Pa., Phila.—DRIVE-IN THEATER—Claude Schlanger, c/o Stephen B. Hazzard, archt., Warington, soon lets contract drive-in theater, Essing Rd. $344,000. CD 3/19.

(Continued on page 127)

Not "How Big?" But "How Good?"

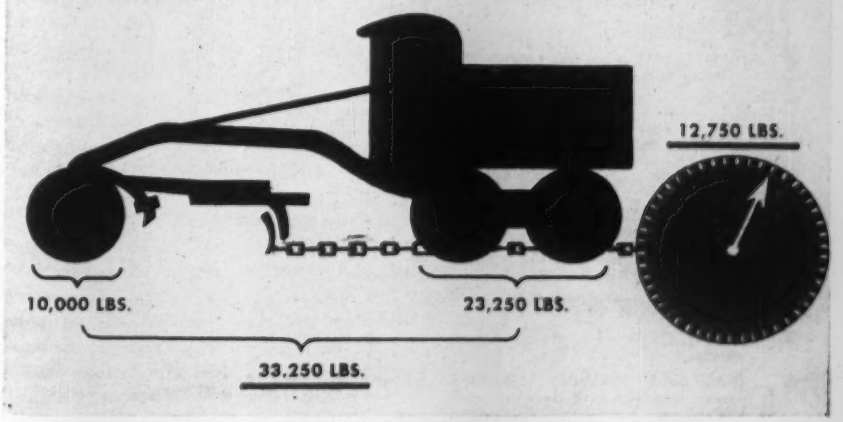
The ability of any motor grader to do hard cutting, and move big blade loads of material in the lower gears, where heavy work is done, depends entirely upon the amount of weight carried on *driving wheels*. Total weight has nothing to do with it.

Most for Your Money
From every standpoint . . . first cost, operating cost and upkeep . . . the A-W Power Grader gives you more for your money . . . moves 30 percent more material than an ordinary grader of equal weight and horsepower; and as much material as heavier, more expensive graders . . . as explained in the diagrams at the right.



ABOVE: This Austin-Western Power Grader weighs 23,250 lbs.—all carried on driving wheels. Working in average dirt, it has a blade pull of 12,750 lbs.

BELOW: To obtain the same blade pull, an ordinary motor grader would have to carry 23,250 lbs. on its *rear drivers;* PLUS about 10,000 lbs. on its *dead front end,* for a total of 33,250 lbs.



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"in the long run, we get MORE DOLLARS out of our MADSEN ASPHALT PLANTS"

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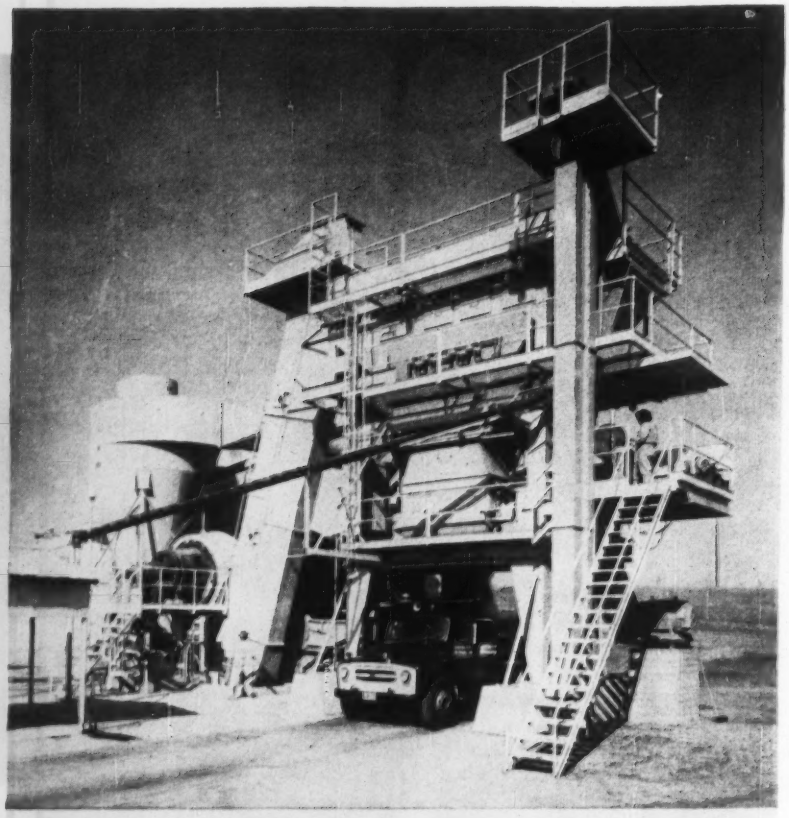

Engineering Data . . .

Concerning Sully-Miller's 6000-lb. Madsen Asphalt Plant shown.

- **PLANT MODEL . . . Madsen Model 481 — 6000-lb. batch capacity.**
- **SCREEN . . . 48" x 16' Symons 2½ deck.**
- **DRYER . . . 96" x 30'.**
- **BURNER . . . 12" combination gas and oil.**
- **DUST COLLECTOR . . . 12' dia. cyclone and 65 tube multiclone.**
- **WET SETTLING EQUIPMENT . . . Madsen Triple Wet Tube Dust Washer-one 6' x 12' and two 6½' x 12' tubes.**
- **TYPE OF FEED . . . Tunnel to cold stone elevator.**
- **PLANT SET UP INCLUDES . . . dust elevator, dust bin and dust entering screw.**

MADSEN *Equipment that Serves*®

Sully-Miller Contracting Co. is one of the largest suppliers of asphalt and asphalt paving in Orange County and southern Los Angeles County. Like other leading producers of asphalt, the prime concern of this contractor is to get big-volume, money-making production day-in and day-out from his asphalt plants. That's why he's mighty glad to have the MADSEN Model 481 6000-lb. plant, shown above, on the job. It's one of several MADSEN Asphalt Plants owned by this successful operator.

The sturdy, oversize construction of MADSEN Plants means greater *sustained* production. With our new MADSEN 6000-lb. Plant, Bob Sully says *"we can turn out approximately 2000 tons per day of close specification mix."*

The MADSEN Model 481 Asphalt Plant offers many superior engineering features. For example: the exclusive MADSEN bin design (patent pending) which eliminates segregation . . . fast, accurate, all-air operation of bin gates, asphalt pressure injection and mixer gate . . . oversize capacity weigh-box, roller mounted so that it may be quickly rolled out of the way for easy field maintenance . . . the famous MADSEN Model 440 Twin-Shaft Pug Mill Mixer with improved mixing action . . . and the patented MADSEN Pressure Injection System.

Whether you are an established operator or a newcomer in the asphalt business — you'll want to get all the facts on the MADSEN Model 481 Asphalt Plant. This outstanding plant is available in 4000-lb., 5000-lb. and 6000-lb. batch capacities to meet your needs.

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DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Lima • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

(Continued from page 124)

BUILDINGS—SLC

Del., Seaford—PLANT—A. E. Baxter Co., engr., Gensee Bldg., Buffalo, N. Y., soon lets contract 2 and 4 story plant for Cooperative Mills, Inc., Seaford, Del. $400,000. CD 2/26.

Pa., Paoli—CHURCH, etc.—Stickle & Assocs., archt., 135 Narberth Ave., Narberth, Pa., soon let contract church, convent and school for Roman Catholic Archdiocese of Phila., 225 H. 18 St., Phila., Pa. $344,000. CD 9/6.

Md., Emmittsburg—SEMINARY—Mt. St. Mary's College, Emmitsburg, soon lets contract masonry, concrete, steel, concrete block, seminary addn. $400,000. Ruppert & May, 1223 Connecticut Ave. N. W., Wash., D. C., archts. CD 4/12.

HEAVY CONSTRUCTION—LB & CA

B. Turecamo Contg. Co., Inc., Belt Parkway, foot of 24 Ave., Brooklyn, N. Y. LB **$112,066**. No. 1, recurbing, reconstr. sidewalks and asph. paving, Bay 10 St.; No. 2, recurbing, reconstr. sidewalks and asph. paving asph. Bay 41 St.; No. 3, grading, curbing, flagging, asph. paving E. 53 St.; No. 4, recurbing, reconstr. sidewalks, asph. paving E. 54 St., BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn 1, N. Y. Bids Apr. 29. CD 4/22;
John Meehan & Sons, 29-27 41 Ave., Whitestone, N. Y. LB **$87,269**, No. 5, curbing, constr. sidewalks and b. conc. paving westerly portion, constr. center mall portion of Nostrand Ave.; LB **$99,198**, No. 7, asph. repaving Rapelye St., b. conc. repaving, Smith St. (Brooklyn, N. Y.);
MacAsphalt Constr. Corp., 33-15 Lawrence St., Flushing, N. Y. LB **$148,886**. No. 6, curbing, flagging constr. malls and asph. paving Seaview Ave. (Brooklyn, N. Y.).

Peter K. Kelly, 208 St. and Hillside Ave., Hollis, N. Y., LB **$110,508 (A) $112,528 (B)** (7 bidders) playground in Alley Park at Horatio Parkway and 228 St., Queens Boro. Contr. Q-1-156, NEW YORK. Comr. Parks, Dpt. Parks Arsenal Bldg., Central Park, 64 St. and Fifth Ave., New York 21, N. Y. Bids May 2. CD 4/24.

NEW JERSEY—State Hy. Dpt., Hy. Office Bldg., Trenton, **A. J. Cunningham & Sons**, 370 Newkirk Ave., Trenton, N. J., LB **$109,713** (5 bidders) 0.55 mi. Parkway Ave. from N. Olden Ave. exten. to Lower Ferry Rds., Ewing Twp., Mercer Co. Bids Apr. 30. CD 4/12.

† **Dist. P. Wks. Office**, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., cancelled bids to have been opened May 22, installing sprinklers, Bldgs. 4 and 19, Naval Security Station, NBy-8372, WASH., D. C. CD 5/6.

R. A. Prendergast & Son, 3010 Sunset Ave., Atlantic City, N. Y. LB **$83,526**, boardwalk redecking between Morris and Texas Aves., ATLANTIC CITY, N. J. City Comrs., City Hall, Atlantic City, N. J. CD 1/14.

† **Edward H. Ellis & Sons**, Merchantville, N. J. LB $165,000. air passenger terminal bldg. addn., alterations and utilities, McGuire Air Force Base, ENG-36-109-57-59, WRIGHTSTOWN, N. J. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. Bids Apr. 24. CD 3/28.

† **Somers Constr. Co.**, Bala Cynwyd, Pa., LB $390,531. battalion headquarters, AAA site, Edgemont, Delaware Co., ENG-6-109-57-61, PENNSYLVANIA. U. S. Eng., **2365 Abbottsford Rd., Phila., Pa.** Bids Apr. 24. CD 4/2.

Crouse & Germer, Cameron and Division Sts., Harrisburg, Pa., CA **$125,054**. swimming pool and bathhouse and paving, PENBROOK, PA. Boro, Boro Hall, Penbrook, Pa. Howard A. Levan, Jr., 25 N. Front St., Harrisburg, Pa., engr.

Wingate Constr. Co., 34 S. 17 St., Phila., Pa., LB **$229,735**, Item No. 1, processing addns., alterations, NBy 11563, Naval Aviation Supply Depot, PHILA., PA. Dpt. Navy, Phila. Naval Base, Phila., Pa. Sanders & Thomas, Pottstown, Pa., engrs.-archts. CD 9/20/51;
Penna. Air Conditioning Co., Parkside and Belmont Ave., Phila., Pa., LB **$135,271** Item No. 2 (Phila., Pa.);
Parkside Air Conditioning Co., Parkside and Belmont Aves., Phila., Pa., LB **$122,917** Item No. 3 (Phila., Pa.).

Fisher Tank Co., 3 and Booth Sts., Chester, Pa., CA $107,666. water standpipe, PHOENIXVILLE, PA. Boro Council, Phoenixville, Pa. Bids Mar. 26. CD 4/8, under LB.

† **U. S. Eng.**, First and Douglas Sts. N.W., Wash. 25, D. C., cancelled bids to have been opened on or about May 23, headquarters ARDC bldg., ENG-49-080-74-(72), ANDREWS AIR FORCE BASE, MD. CD 4/17.

Ligon & Ligon, 3310 Ridgewood Ave., Baltimore 15, Md., LB **$225,883** (4 bidders) Conduit Constr. Contr. 33, concrete encased conduit, BALTIMORE, MD. City, Bureau Mech. & Elec. Services, 320 Municipal Bldg., Baltimore 2, Md. W. Rayner Straus, 320 Municipal Bldg., Baltimore, Zone 2, engr. CD 5/10/55;
Traffic Controls Corp., 4917 St. Elmo Ave., Bethesda, Md., LB **$210,210** (5 bidders) Conduit Constr. Contr. 34, concrete encased conduit (Baltimore, Md.).

Marocco Constr. Co., 231 S. High St., Baltimore 2, Md., LB **$45,740** (8 bidders) Contract 560-W, water main extens., Pikesville, TOWSON, MD. County Executive, Baltimore Co., County Office Bldg., Towson, Md. Bids Apr. 25. CD 4/11.

Vinton Constr. Co., 908 Gist Ave., Silver Spring, Md. LB **$58,993**. (9 bidders) 30-in. trunk water main in Bladensburg, Rd. N.E., WASH., D. C. D. C. Govt., Dpt. Sanitary Eng., 499 Pa. Ave. N.W., Wash., D. C. Bids Apr. 29. CD 4/17.

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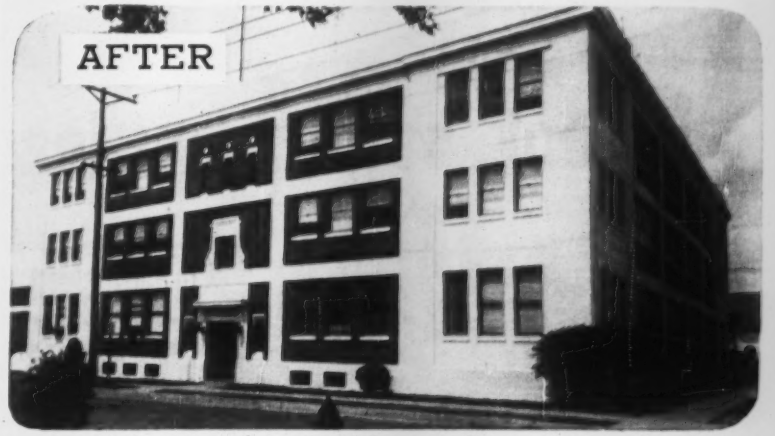
Severe weathering had deteriorated sections of cornices, sills, lintels and ledges. Cracks permitted water penetration, causing damage to interior of building.

All cracks were opened with hammer and chisel, spalled areas cut and cleaned, then patched with THORITE, followed by two brush coat applications of Pearl Gray THOROSEAL.

Brick was left uncoated to develop pleasing contrast. See Circulars No. 16 and 20.



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THOROSEAL ***MASONRY SEALER*** seals masonry walls against water and beautifies surface

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NEW EAGLE, PENNA. CENTERVILLE, IND.

Put this versatile DGH-100 Hammer to work on any job you have ★ you'll be amazed at the number of jobs it can handle ★ operates on compressed air or steam ★ delivers a rated striking energy of 386 pounds ★ just over 4 feet long it is readily moved about in a jeep. Illustrated here is the DGH-100 Hammer being used with a LeRoi Tract-Air breaking concrete curbing.

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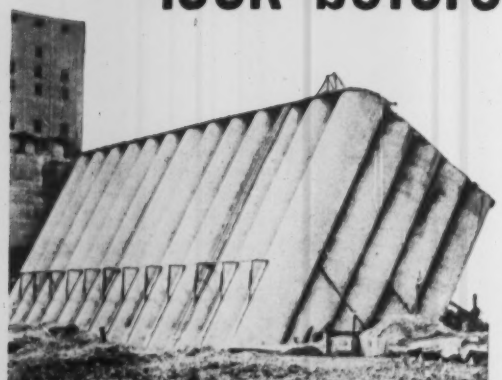
look before you lean



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DELAWARE—State Hy. Dpt., Hy. Dpt. Admin. Bldg., Dover. Bids opened 4/24.

Del.—**Bear Paving Co.**, Bear, Del., LB **$82,902**, paving roads;

Del.—**James Julian, Inc.**, 405 duPont Rd., Elsmere, Del., LB **$92,266**, County Roads 471, 375, 417, 419 and 420;

Del.—**Montgomery Constr. Co.**, Laurel, Md., LB **$98,253**, paving for Roads 471, 375, 417, 419 and 420; LB **$174,495**, paving on County Roads 201, 205, 202, 207A, 216, 38E, 621A, 620 and 209;

Del.—**Standard Bitulithic Co.**, foot of Brill St., Newark, N. J., LB **$117,170**, County Roads 201, 205, 202, 207A, 216, 38E, 621A, 620 and 209. CD 4/17.

BUILDINGS—LB & CA

▲ **CWC Constr. Corp.**, 56 Court St., Brooklyn 1, N. Y., CA **$6,000,000**. three 14 story APARTMENTS, Linden Blvd. and Rockaway Ave., BROOKLYN, N. Y. Earl W. Jimerson Housing Co., Inc., 32 Broadway, New York 4, N. Y. (Correction—contractors address and cost) CD 4/11, under CA.

Vicbar Constr. Co., 17 Neptune Ave., Brooklyn, N. Y., Owner Builds. **$350,000**. 25 HOUSES at 1404-1460 E. 105 St., BROOKLYN, N. Y. Morris Rothstein & Son, 186 Joralemon St., Brooklyn, Zone 2, archts.

Cassiol Constr. Co., Washington Market, Buffalo, N. Y., CA **$522,740** Emerson VOCATIONAL HIGH SCHOOL, BUFFALO, N. Y. Bd. Educ., 801 City Hall, Buffalo, N. Y. Pfohl & Stoll, 85 Niagara St., Buffalo, Zone 2, archts. Awarded Apr. 24. CD 12/20.

Danser, Inc., 147-66 Village Rd., Maspeth, N. Y., Owner Builds. **$345,000**. 31 HOUSES, 67 St. and 61 Drive, MASPETH, N. Y. Anthony Signorielli, 120-44 Queens Blvd., Key Gardens, N. Y., archt.

▲ **James J. Waters Corp.**, 415 Lexington Ave., New York, N. Y., CA **$2,695,000** (3 bidders) HIGH SCHOOL and BUS GARAGE, MASSENA, N. Y. Massena Central School Dist. No. 1, Massena, N. Y. (Correction—price and number of bidders) CD 4/16, under CA.

▲ **Bechtel Co.**, 161 E. 42 St., New York, N. Y., CA Est. **$88,000,000**. design and construct aluminum reduction PLANT, MASSENA, N. Y. Reynolds Metals Co., 3 and Grace Sts., Richmond, Va. CD 9/12.

Modart Constr. Co., 220 W. 42 St., New York 36, N. Y., Owner Builds. **$384,000**. 32 HOUSES, 25 Ave. and Whitestone Parkway, WHITESTONE, N. Y. B. R. Levinson, 167-16 Hillside Ave., Jamaica, N. Y., archt.

Murray Constr. Co., 200 Morris Ave., Springfield, N. J. CA **$95,000**. FACTORY and OFFICES, MANSFIELD, N. J. Sherwatt Mfg. Co., c/o contractor. Rotwein & Blake, 1018 Stuyvesant Ave., Union, N. J., archts.

▲ **The Foundation Co.**, 58 William St., New York, N. Y., CA excavation for 24 story HOME OFFICE bldg., Broad and Bank Sts., NEWARK, N. J. Prudential Life Insurance Co., 763 Broad St., Newark, N. J. Voorhees, Walker, Smith & Smith, 101 Park Ave., New York, N. Y., archts. Awarded Apr. 26. 5/11/56.

George W. Clendening, 30 Maplewood Ave., Phila., Pa. CA **$400,000**. 1 story, 48,000 sq. ft. structural steel, brick, block, FACTORY and OFFICE, PENNSAUKEN, N. J. Schaevitz Engineering Co., Box 505, Camden, N. J.

Bostron Bros., 8 Elkstrom Rd., Dover, N. J. LB **$347,715** SCHOOL, Stanhope Rd., SPARTA, N. J. Bd. Educ., Sparta Twp., Sparta, N. J. CD 11/5.

▲ **A. A. LaFountain Corp.**, 1745 N. Olden Ave., Trenton, N. J., CA **$1,100,000** (10 bidders) general contract St. Mary's CATHEDRAL and RECTORY, N. Warren and Bank Sts., TRENTON, N. J. Diocese of Trenton, Trenton Trust Bldg., Trenton, N. J. Bids Apr. 23, awarded May 2. CD 4/4.

Leon Crane, Newtown Square, Pa., Separate Contracts, **$350,000**. RESIDENTIAL DEVELOPMENT, New Ardmore Ave., BROOMALL, PA. James E. Fox, Broomall, archt.

E. Bentley Dilworth, Newtown Square, Pa. Separate Contracts, **$350,000**. RESIDENTIAL DEVELOPMENT, Paper Mill Rd., etc., NEWTOWN SQUARE, PA.

Irwin & Leighton, Inc., 1505 Race St., Phila., Pa. CA **$150,000** 3 story, brick, block, structural steel frame "S" BLDG addn., PHILA., PA. ITE Circuit Breaker Co., 19 and Hamilton St., Phila., Pa. Axel Schultze, 10 S. 18 St., Phila., Pa., engr.

Irwin & Leighton, Inc., 1505 Race St., Phila., Pa., CA **$800,000**. 1 story, 110,000 sq. ft., steel, masonry concrete, branch WAREHOUSE and OFFICE, PHILA., PA. United States Rubber Co., 1230 Avenue of the Americas, New York, N. Y. The Ballinger Co., 1625 Race St., Phila., Pa., engr.-archt.

James S. Scully, 6722 N. Broad St., Phila., Pa. Separate Contracts, **$420,000**. RESIDENTIAL DEVELOPMENT, Valley and Cloverleaf Rds., RYDAL, PA.

▲ **McCloskey & Co.**, 1620 W. Thompson St., Phila., Pa. LB **$1,524,500**, general contract PRISON and prison farm, WEST CHESTER, PA. Comrs. Chester Co., West Chester, Pa. Bids Apr. 25. 4/16.

Commonwealth Constr. Co. Inc., 5314 Reisterstown Rd., Baltimore, Md., CA **$434,000**. 31 frame DWELLINGS, Kalton Court, Williamsburg Development, north of BALTIMORE, MD. Hayward Realty, Inc., 5314 Reisterstown Rd., Baltimore, Md.

▲ **Stone & Webster Eng. Corp.**, 1400 N. Royal St., Alexandria, Va., CA Total est. **$30,000,000**. general contract POWER PLANT, incl. heavy equip., DICKERSON, MD. Potomac Electric Power Co., 10 and E Sts. N.W., Wash., D. C. CD 1/23/56.

John L. Briggs & Co., Georgetown, Del., CA **$93,000**. 1 story masonry FACTORY, MILFORD, DEL. Milford Stitching Co., Inc., Milford, Del.

(Continued on page 130)

Rough, broken ground creates no problem for Tractair. Equipment is driven to any point on the site, transporting all necessary tools in its own trailer.

Augering crew preparing to drill beneath the sidewalk for water and sewer lines, using Tractair power.

Contractor Finds 6 Ways to Use Tractair*

Multi-purpose tractor-compressor keeps busy all day on home-building project.

High mobility reduces moving and set-up time — two big money-wasters.

Hutchinson Homes, of Denver, Colorado, had a program calling for the completion of 1,650 brick-veneer homes in just one year and nine months. The job was spread over plenty of real estate and demanded a mobile power source that could quickly move from site-to-site providing power for many types of work.

Hutchinson Homes chose the Le Roi Tractair 125 to fill the bill.

Hutchinson Homes already owned a Tractair 105. They'd had it in steady service for five years before it got its first overhaul. That kind of performance proved Le Roi had the dependability they needed.

Reduces Dead Time

One Tractair was needed full time for augering water and sewer lines beneath the freshly-paved sidewalks. A big problem in work of this type was that moving and setup time is greater than drilling time. Tractair's high mobility substantially reduced this dead time, kept two men busy augering.

The other Tractair and a Le Roi 105 portable air compressor kept busy drilling, breaking, augering, chipping and trimming concrete, tamping, and powering an impact wrench.

Speeds Job Completion

Tractair's mobility and versatility enabled the operators to move rapidly and easily from house to house, performing a wide range of jobs while saving time and manpower. It contributed strongly to the rapid completion of this large housing project well within the time schedule.

Tractair can bring this same usefulness to your next job. Write us today for complete information and data on this tractor-compressor.

*"Tractair" is the registered trademark for Le Roi's combination tractor—air compressor.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, portable and Tractair® air compressors, stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

(Continued from page 128)

SOUTH

HEAVY CONSTRUCTION—BA

† **S. C., Beaufort**—INFIRMARY, etc.—BA 5/21—Dist. P. Wks. Office Bldg. No. 13, U. S. Naval Base, Charleston, infirmary and dental clinic, U. S. Marine Corps Auxiliary Air Station, NBy 8628, Spec. 8628/56. Extended date. CD 4/3.

† **S. C., Parris Island**—DEPOT THEATER—BA 5/21—Dist. P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, depot theater, U. S. Marine Corps Recruit Depot, Spec. 6497/56. Extended date. CD 4/9.

† **S. C., Parris Island**—DISTRIBUTION FACILITIES—BA 5/21—Dist. P. Wks. Office Bldg. No. 13, U. S. Naval Base, Charleston, S. C., heating and steam distr. facilities, U. S. Marine Corps Recruit Depot, NBy 6493, Spec. 6498/56. Extended date. CD 4/5.

Fla., Fort Lauderdale—DISTRIBUTION SYSTEM—BA 5/23—Bd. Comrs. State institutions, State Capitol, Tallahassee, field distr. sys., power distr. and communication sys. South Florida State Hospital, West Hallandale. Plans deposit $15. Extended date. Gamble, Pownall & Gilroy, 1407 E. Las Olas Blvd., archts. CD 4/25.

† **Fla., Jacksonville** — BUILDING ALTERATIONS — BA 5/23—Officer in Charge of Constr. Bldg. 902, Naval Air Station, Building 167, alterations, Naval Air Station, NBy-10184, Spec. 10184/57. CD 8/27.

Fla., Riviera Beach—BA 5/27—Town, W. F. Johnstone, mgr., water treatment plant. Plans deposit $50. Briley, Wild & Assocs., Box 3052, Daytona Beach, engrs.

† **Kentucky**—BA 5/27—U. S. Eng., P.O. Box 2127, Huntington 18, W. Va., relocation of railroad and hy. culvert at Catlettsburg, Ky. for Greenup Locks & Dam Proj., Serial No. CIVENG-46-022-57-79. CD 5/3.

† **N. C., Elizabeth City**—BUILDINGS REPAIRS—BA 5/28—Dist. P. Wks. Office, Fifth Naval Dist., Bldg. N-26, U. S. Naval Base, Norfolk, Va., Buildings repairs Naval Air Facility, NBy-10682, Spec. 10682/57.

† **Va., Fisherville**—POWER INSTALLATION—BA 5/28—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, emergency power installation, Naval Reserve Training Center, NBy-10712, Spec. 10712/57.

† **S. C., Beaufort**—BA 6/11—P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, electrical revisions for Class "C" Maintenance Hangar 10, U. S. Marine Corps Auxiliary Air Station, NBy 13202, Spec. 13202/57. CD 8/28.

† **S. C., Charleston**—NAVAL DEPOT—BA 6/11—Dist. P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, existing railroad repair, Naval Ammunition Depot (Liberty Hall Annex) NBy 13201, Spec. 13201/57.

† **Miss., Columbus**—ELECTRICAL DISTRIBUTION SYS—BA On Or About 5/28—U. S. Eng., 2301 Grand St., Mobile, Ala., electrical distr. sys., Columbus Air Force Base, ENG-01-076-57-92, CD 8/23.

† **Va., Dam Neck**—TRAINING PLATFORM—BA 5/28—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, training platform, Fleet Air Defense Training Center, NBy 10713, Spec. 10713/57.

† **Miss., Columbus**—DORMITORIES, etc.—BA On Or About 6/4—U. S. Eng., 2301 Grand St., Mobile, Ala., utilities for airmen's dormitories and dining hall and rehabilitation of utility sys., Columbus Air Force Base, ENG-01-076-57-91, CD 8/23.

N. C., Hickory—BA 6/4—City, City Hall, ¾ m.g.d. sewage treatment plant. Plans deposit $25. Abernethy & Scott, Hickory, engrs. CD 11/7/55.

† **Fla., Key West**—STANDARD TACAN—BA 6/11—P. Wks. Office, 6th Naval Dist., Bldg. 13, Charleston, S. C., standard tacan bldg., steel tower, electric power and lighting sys., Naval Air Station, NBy 10273, Spec. 10273/57.

† **Georgia**—BA About 6/14—U. S. Eng., 200 East St. Julian St., Savannah, new work dredging, Savannah Harbor, Serial No. CIVENG-09-133-57-135.

† **Fla., Mayport**—MISCELLANEOUS REPAIRS—BA 6/15—Dist P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, S. C., misc. repairs to various buildings U. S. Naval Auxiliary Air Station, NBy-10295, Spec. 10295/57. Extended date. CD 4/29.

BUILDINGS—BA

La., Pineville—SANCTUARY—BA 5/23—First Baptist Congregation, Pineville, 1 and 2 story sanctuary $500,000. Plans deposit $25. J. Cheshire, Peyton & Assocs., c/o Continental American Bank Bldg., Shreveport, archts.

Fla., Miami—LABORATORY, etc.—BA 5/24—Bd. Comrs. State Institutions, State Capitol, Tallahassee. district laboratory and health center, N.W. 14 St. and 14 Ave. Coda Assocs., 505 Chamber of Commerce Bldg., archts. Jules P. Channing & Assocs. 71 N.W. 54 St., struct. engrs. R. L. Duffer & Assocs., 3356 Virginia St., mech. and electrical engrs. CD 3/26/56.

† **N. C., Washington** — ELECTRONICS FACILITY — BA 5/28—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va., Naval Reserve Electronics facility, NBy-10649, Spec. 10649/57.

† **W. Va., Parkersburg**—TRAINING CENTER—BA 5/28—U. S. Eng., P. O. Box 2127, Huntington, Zone 18, army reserve training center and maintenance shop, ENG-46-022-57-31. Extended date. CD 4/30.

S. C., Charleston—HOSPITAL—BA 5/28—McClellan-Banks Hospital, c/o Dr. T. C. McFall, chn., 135 Cannon St., 30 bed hospital, $600,000. Plans deposit $100. A. E. Constantine, 139 Calhoun St., archt.

† **Ga., Fort Benning**—TELEPHONE—BA About 6/8—U. S. Eng., 200 E. St. Julian St., Savannah, telephone building, Kelley Hill, Serial No. ENG-09-133-57-46. CD 8/29.

† **Fla., Jacksonville**—GARAGE—BA 6/12—Dist. P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, S. C., marine corps garage for amphibious vehicles, U. S. Naval and Marine Corps Reserve Training Center, NBy-6482, Spec. 6482/56.

† **Ga., Fort Valley**—TRAINING CENTER—BA About 6/13—U. S. Eng., 200 E. St. Julian St., Savannah, U.S.A.R. Training Center, (200-man), Serial No. ENG-09-133-57-58.

† **Fla., Key West**—WORKROOM—BA 6/18—General Service Admin., P. Bld. Serv., Region 4, 50 Seventh St. N.E., Atlanta, Ga., work room exten., court house and custom house, Proj. CR-41635.

La., Chalmette—SCHOOL—BA 6/12—Parish School Bd., J. F. Gautheir, supt., Chalmette, 2 story, rein.-con., brick, concrete block elementary school, St. Bernard Parish. Plans deposit $40. John M. Lachin, 511 Cotton Exchange Bldg., New Orleans, archt.

Ala., Irondale—PLANT—Bids Asked—Birmingham Mfg. Co., 1101 2nd Ave., N., Birmingham, mfg. plant to build heavy-duty trailers, $225,000.

BUILDINGS—SLC

Fla., West Palm Beach—MANUFACTURING, etc.—Pratt & Whitney Aircraft Div., United Aircraft, Box 2691, soon lets contract, Job 2129-A, plumbing work. Job 2129-A, steam and cooling water piping both for manufacturing and office bldg. George H. Miehls, 345 New Center Bldg., Detroit 2, Mich., engr. CD 9/21.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond, Va.—**Norfolk Contg. Co.**, P. O. Box 4225, Norfolk 6, Va., LB $1,957,938 (4 bidders) Contract D-4, Norfolk Approach Hy., highway and structures;

Va.—**George M. Brewster & Son**, 274 Fort Lee Rd., Bogota, N. J., LB $1,723,515 (1 bidder) Contract N-1, Newport News connector highway and structures. Bids May 1. CD 4/17.

VIRGINIA—Richmond-Petersburg Turnpike Auth., 1015 E. Main St., or P. O. Box 1-R, Richmond, Bids opened 4/30,

Webster & Webster Inc., 1366 Main St., East Hartford, Conn., LB $381,290, Contr. P-5-GR, Sections A, C, D, E and F, guard rail between Southern terminus at U. S. Route 1, Dinwiddie Co. and northern terminus at U. S. Route 301, Henrico Co. Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York, N. Y., engrs. CD 4/11.

† **Dpt. P. Wks. Office**, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., cancelled bids to have been opened May 15, restoration of facilities in

(Continued on page 134)

DESIGNERS

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ERECTORS

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ARCHITECTURAL METALS
AND LIGHT STRUCTURAL STEEL

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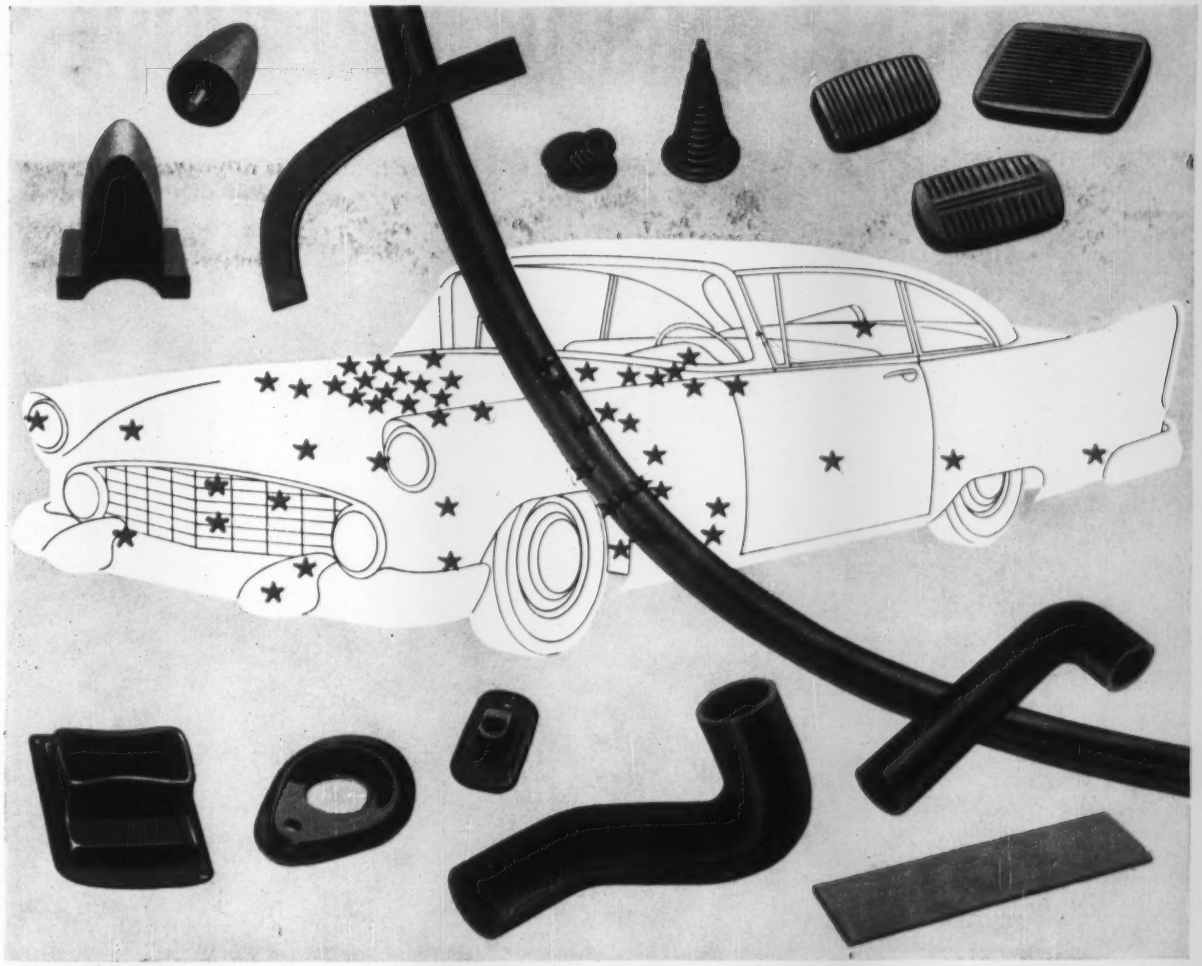

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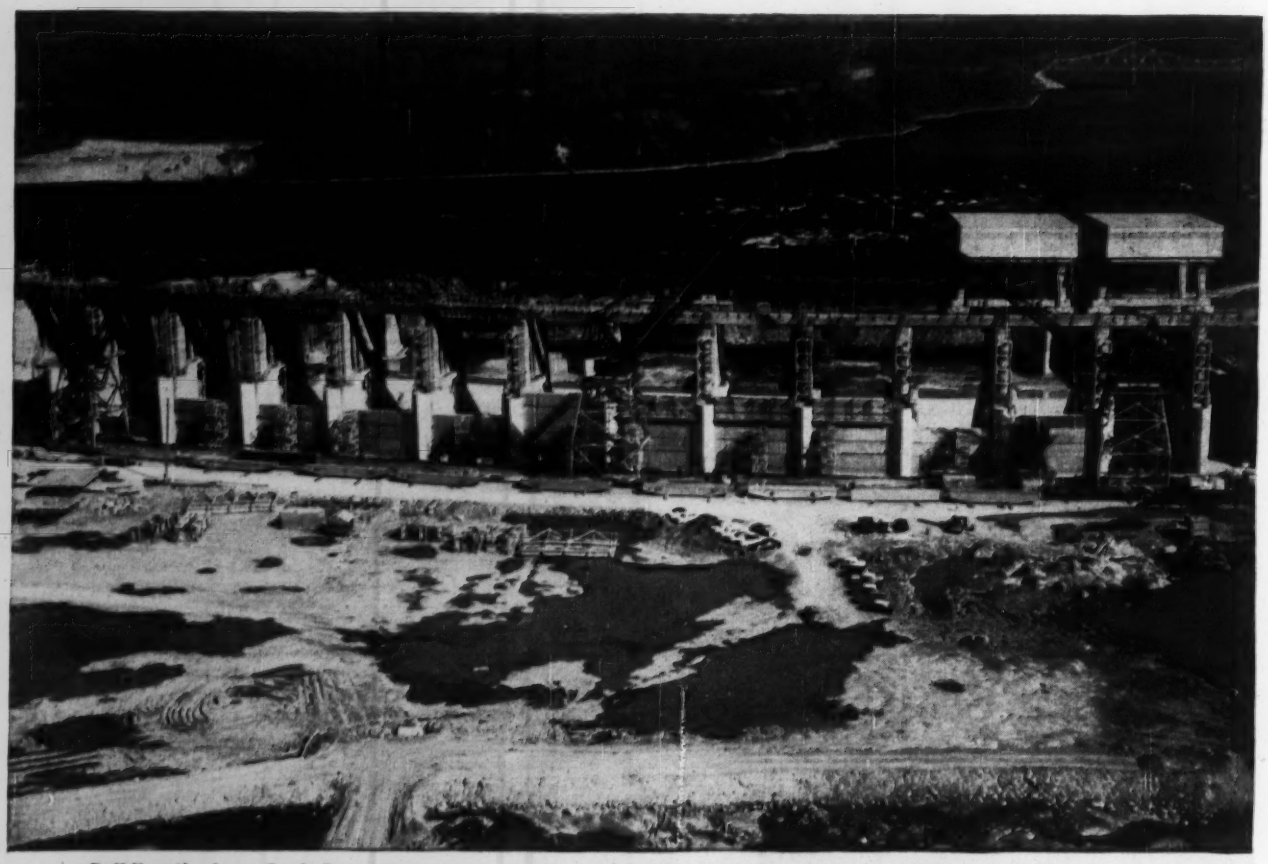
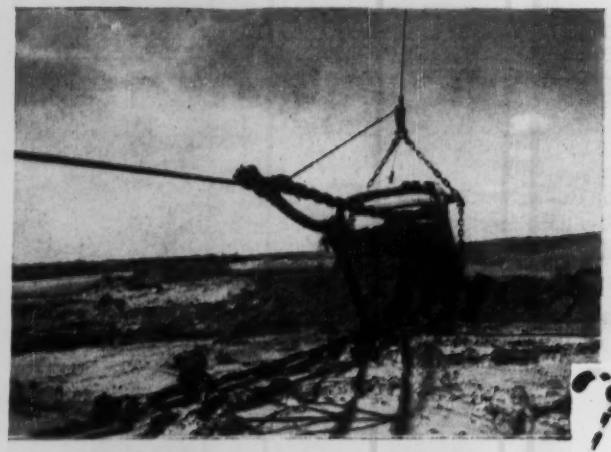
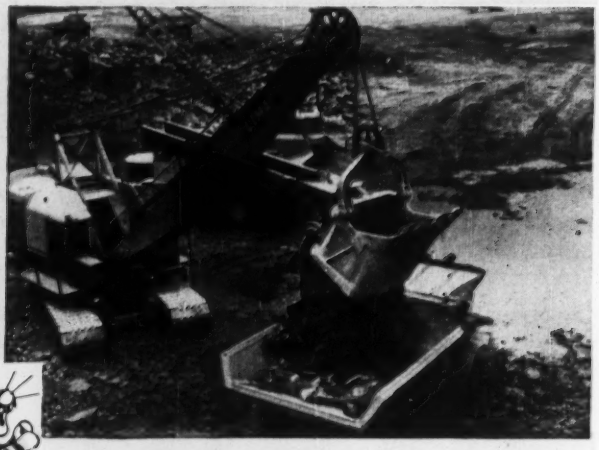
TIGER BRAND WIRE ROPE



Building the Long Sault Dam. When completed, this dam will contain approximately 653,000 cu. yds. of concrete. The three large gantry cranes used in pouring this concrete are rigged with Tiger Brand Wire Ropes.



Sticky marine clay weighs almost twice as much as regular overburden, puts greater strain on wire rope and equipment.

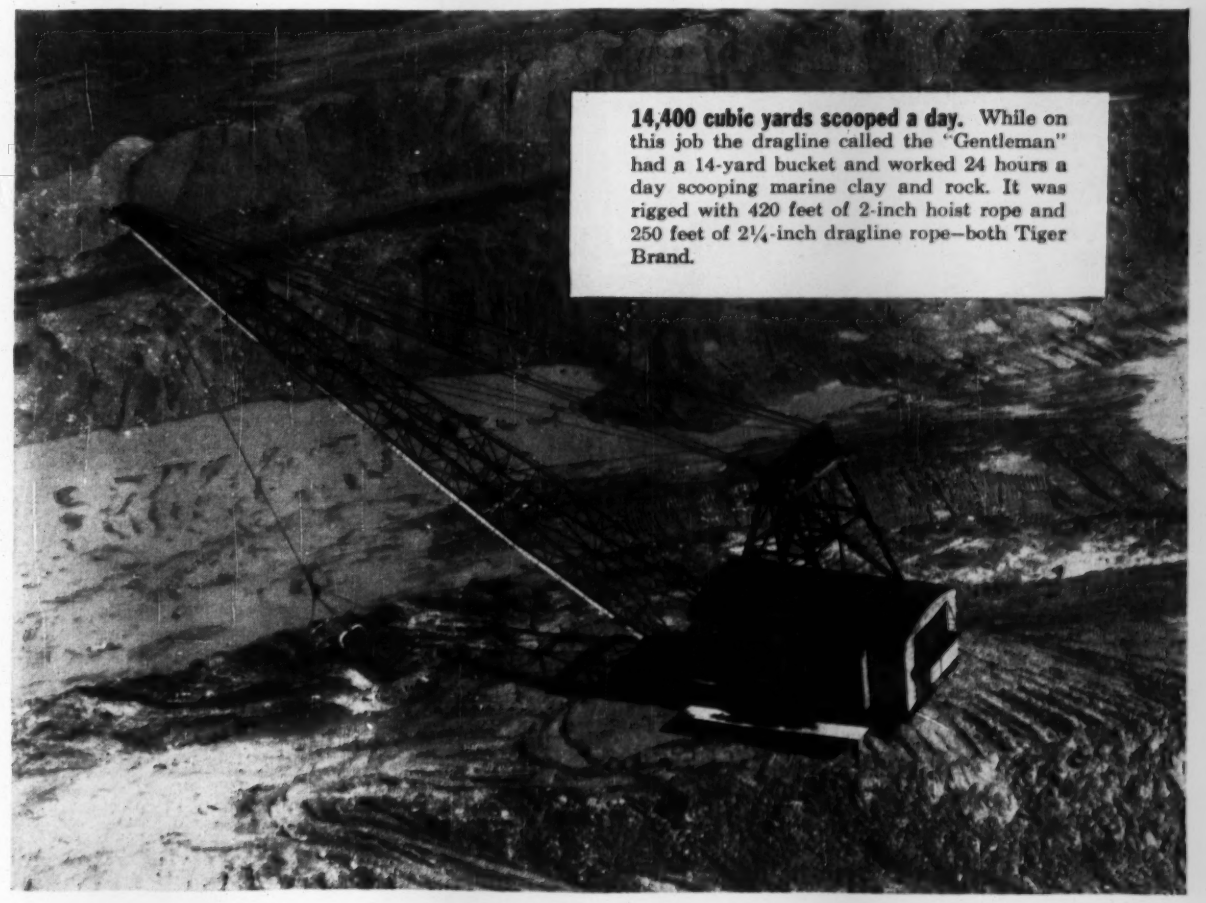


Shovel rope takes a beating and Tiger Brand is made to withstand rough service and heavy abrasion.

at work on St. Lawrence Seaway and Power Projects

THE FABULOUS ST. LAWRENCE SEAWAY and St. Lawrence Power Projects are the largest construction undertakings of all time, costing over $900 million for the Seaway and power development. To keep the big machines working at top speed requires all kinds of wire rope—and most of it is USS American Tiger Brand.

Speed was such an important factor on this job that all equipment and supplies were selected with trouble-free performance in mind. American Steel & Wire set up a wire rope warehouse nearby for quick deliveries of any type of wire rope needed. Here are a few illustrations of the many jobs being performed by Tiger Brand Wire Rope.



14,400 cubic yards scooped a day. While on this job the dragline called the "Gentleman" had a 14-yard bucket and worked 24 hours a day scooping marine clay and rock. It was rigged with 420 feet of 2-inch hoist rope and 250 feet of 2¼-inch dragline rope—both Tiger Brand.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
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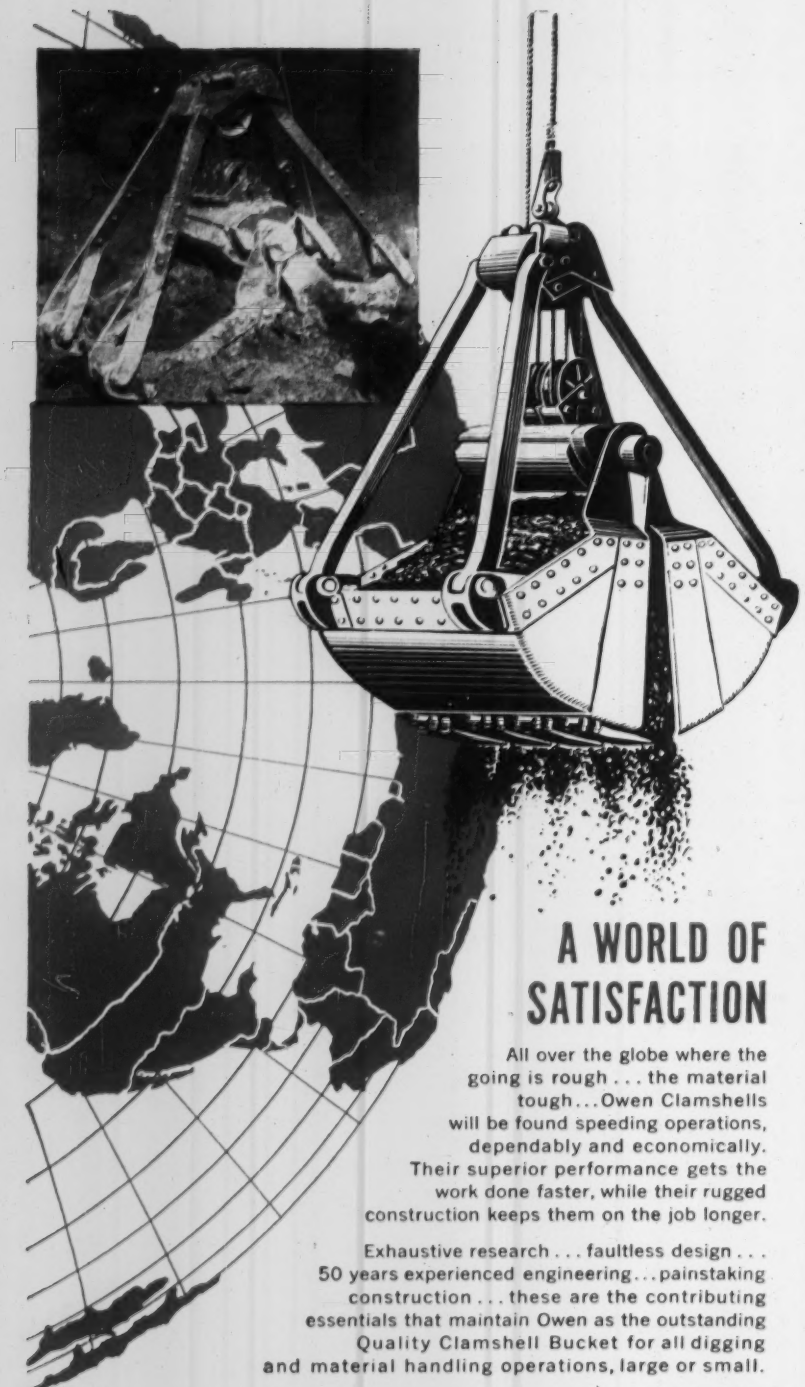

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(Continued from page 130)

Bldg. 9, Headquarters Battalion, HDQMC, Henderson Hall, NBy-11371, ARLINGTON, VA. CD 4/30.

† **U. S. Eng.**, foot of Front St., Norwalk 1, Va., rejected bids Apr. 18, Runway 15-33 exten. and rein.-forcement, Byrd Field, ENG-44-110-57-25, RICHMOND, VA. LB $936,595. CD 4/26, under LB.

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh. **Bowers Constr. Co., Inc.**, Box 1706, Raleigh, N. C., CA $638,471, bridge and approaches U. S. 74, Proj. 6100, F-169 (22) Anson and Richmond Counties. Bids Apr. 23, awarded Apr. 29. CD 4/29, under LB.

▲ **NORTH CAROLINA**—State Hy. & P. Wks. Comn., Raleigh. **Clinchfield Concrete Co.**, Kingsport, Tenn., CA $2,603,493 stab. aggreg. base and bit. sub-grade reinf.- and 9 in. c. con. 14.87 mi. US 29, Proj. 6736, I-708 (3), F-708 (4), Rowan and Davidson Counties. Bids Apr. 23, awarded Apr. 29. CD 4/29, under LB.

Blythe Brothers Co., 2911 Hutchinson Ave., Charlotte, N. C., LB $610,950. Catawba Creek Outfall Sewer, GASTONIA, N. C. City, City Hall, Gastonia, N. C. Bids Apr. 8. CD 4/10.

† **Arnold M. Diamond**, 115 Middle Neck Rd., Great Neck, N. Y., LB $300,000 (4 bidders) modernization of Test Cells No. 6, Marine Corps Air Station, NBy-7637, Sec. 7637/56, CHERRY POINT, N. C. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Apr. 29. CD 4/11.

▲† **Gilbert Eng. Co., Inc.**, Statesville, N. C., CA $1,675,076. Catawba Creek sewage treatment plant, GASTONIA, N. C. City, City Hall, Gastonia, N. C. Bids Apr. 16. CD 4/30, under LB.

Blythe Bros. Co., 2911 Hutchinson Ave., Charlotte, N. C., CA $610,950. Catawba Creek Outfall Sewer, GASTONIA, N. C. City, City Hall, Gastonia, N. C. Bids Apr. 8. CD 5/6, under LB.

City, City Hall, Belle Glade, Fla., rejected bids Apr. 29, two swimming pools, BELLE GLADE, FLA. CD 4/26.

† **Koppers Co., Inc.**, Koppers Bldg., Pittsburgh, Pa., LB $115,929. cleaning, coating aqueduct, KEY WEST, FLA. P. Wks. Officer, Sixth Naval Dist., Bldg. 13, U. S. Naval Base, Charleston, S. C. Bids Apr. 25. CD 4/5.

Joe Reinertson, 2027 N.W. 7 Ave., Miami, Fla., LB $513,326, Distr. SR-338, Reid Acres Sanitary Sewer, MIAMI, FLA. City Comn., City Hall, 3332 Pan American Dr., Miami, Fla. Bids May 1. CD 4/41; **Group Bros. Inc.**, 4151 S. Dixie Hy., Miami, Fla., LB $264,501 Distr. SR-316, Braddock Storm Sewer (Miami, Fla.).

Ebsary Foundation Co., 2154 N.W. North River Dr., Miami, Fla., LB $103,322. Meridian Ave. Bridge over Collins Canal, MIAMI BEACH, FLA. City, City Hall, 1130 Washington Ave., Miami Beach, Fla.

† **Kenneth Fulghum**, Box 1426, Pensacola, Fla., LB $79,453, cadet recreation club addn. Naval Air Station, NBy-982, Spec. 982/56, PENSACOLA, FLA. Officer in Charge of Constr., Bldg. 45, Naval Air Station, Pensacola, Fla. Bids Apr. 17. CD 3/27.

Cone Bros. Contg. Co., 309 Caesar Ave., Box 1301, Tampa, Fla., LB $174,829. Div. XA 2; LB $117,202, Div. XG-19 and XG-33, sewage disposal system, TAMPA, FLA. City, Bd. Representatives, City Hall, Tampa, Fla. Bids Apr. 23. CD 3/26.

† **Nashville Bridge Co.**, Shelby Ave., Nashville, Tenn. CA $789,558. constr. lower gate for Wilson Lock at Muscle Shoals, ALABAMA. Tennessee Valley Authority, New Sprankle Bldg., Knoxville, Tenn. Awarded May 1. **Ingalls Iron Works Co.**, 620 4th Ave. S., Birmingham, Ala., CA $89,476. constr. floating bulkhead for new Wilson Dock, Muscle Shoals (Alabama).

Campbell Constr. Co., Inc., Ft. Milam, Shreveport, La., LB $89,100. Contract No. 1, street paving, FRANKLIN, LA. Town, Franklin, La.

† **Lake Charles Electric Co.**, 1912 Moss St., Lake Charles, La., LB $283,000, est. $100,000. navigational aids and communication facilities, Naval Auxiliary Air Station, NBy 6409, NEW IBERIA, LA. Bureau Yards & Docks, Dpt. Navy, 8th Naval Dist., U. S. Naval Station, New Orleans, La. Bids Apr. 18. CD 3/21.

▲† **Terry & Wright**, P. O. Box 121, Louisville, Ky., CA $1,049,956. dam and spillway, hy. bridge and paving. Rough River Reservoir, Grayson and Breckinridge Counties, CIVENG-15-029-57-59, KENTUCKY. U. S. Eng., P. O. Box 59, Louisville, Ky. Bids Apr. 23, awarded May 1. CD 4/26, under LB.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort, received no bids Apr. 26, bridge repairs, (electrical) Bridge Repair Group 3 (1957). McCracken and McLean Counties. CD 4/15.

KENTUCKY—State Hy. Dpt., Frankfort, Bids opened 4/26,

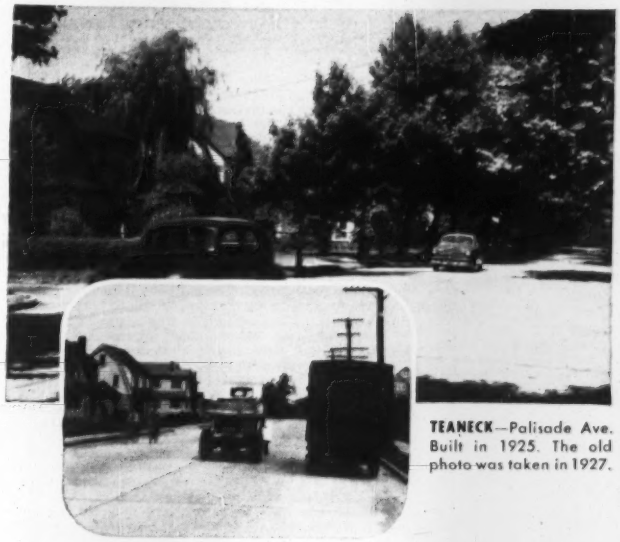
Ky.—**Robert L. Carter Co.**, 242 E. Main St., Frankfort, Ky., LB $71,376, (4 bidders), b. conc. surf., Class I, (limestone aggreg.), 14.313 mi. various roads, SP Group 10, Oldham and Jefferson Counties, $74,028, (3 bidders), b. conc. surf., Class I, 11.836 various roads, SP Group 22, Harrison and Scott Counties;

Ky.—**R. R. Dawson Bridge Co.**, Bloomfield, Ky., LB $124,985 (4 bidders), b. conc. surf., Class I (limestone aggreg.) and Alternate "B" piling 0.378 mi. SP 22-48, The Grayson Hitchins-Louisa (Ky. 1) Road, Carter Co.; LB $227,328 (7 bidders), b. conc. surf., Class I (limestone aggreg.), 0.776 mi. SP 56-218, The Inner Belt Line US 43 (2), Jefferson Co.;

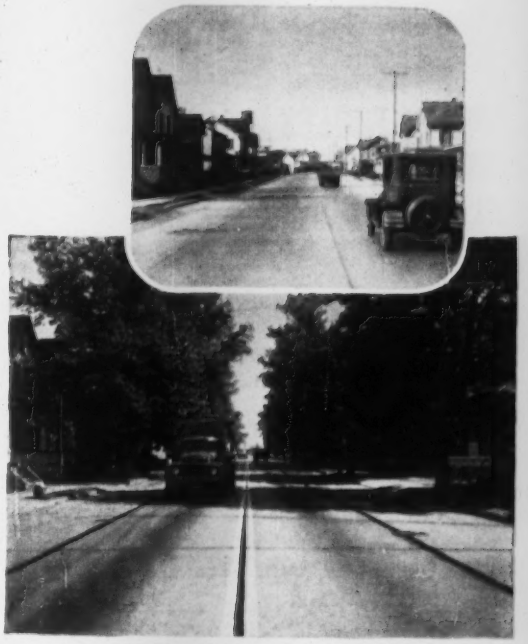
Ky.—**MaGo Constr. Co.**, Bardstown, Ky., LB $84,252 (5 bidders), b. conc. surf., Class I, 16.243 mi. SP Group 27, Jackson and Rockcastle Counties; LB $122,739 (2 bidders), b. conc. surf., Class I, 5.699 mi., SP Group 31, The Bardstown and Louisville Road, Nelson Co.;

Ky.—**R. B. Tyler Co.**, 1446 Levering, Louisville, Ky. LB $99,577 (2 bidders), b. conc. surf., Class I,

(Continued on page 136)



TEANECK—Palisade Ave. Built in 1925. The old photo was taken in 1927.



WESTVILLE—Delsea Drive. Built in 1927. The old photo was taken in 1927.

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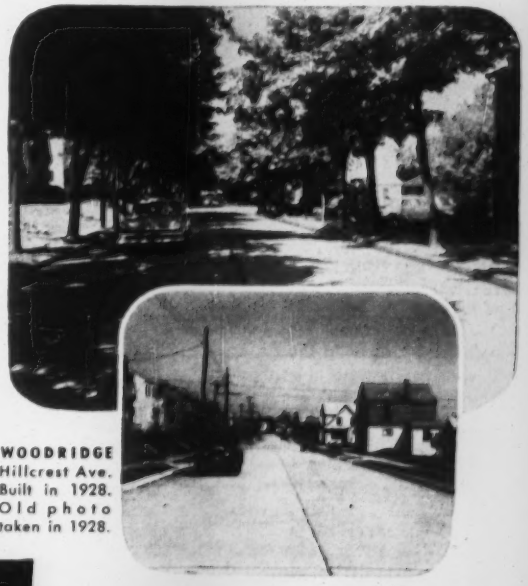
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work



WOODRIDGE Hillcrest Ave. Built in 1928. Old photo taken in 1928.

CAMDEN—35th St. at River Road. Built in 1928. The old photo was taken in 1928.

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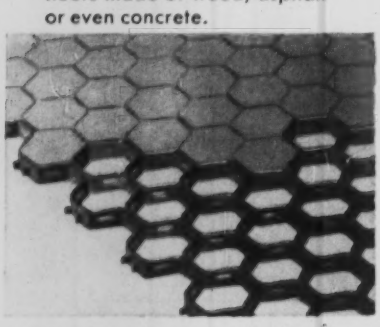

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(Continued from page 134)

(limestone aggreg.), 2.308 mi. SP 20-124, The Mayfield and Wickliffe Road, F 509 (9), Carlisle Co.;

Ky.—**Greer Bros. & Young**, Box 346, London, Ky., LB **$126,915**, (12 bidders), traffic bound limestone, 2.709 mi., RS 33-203, The South Irvine and Ross Creek Road, Estill Co.;

Ky.—**Tom Ballard Co.**, Bardstown, Ky., LB **$86,484**. (11 bidders), traffic bound limestone, 4.898 mi. RS 106-726, The Hatton Road, Shelby Co.;

Ky.—**W. M. Hooper**, Caneyville, Ky., LB **$100,345**, (5 bidders), b. surf., Class I (Alternate "A", 12 in. steel bearing piles), SP 24-45 The Hopkinsville and Kirkmansville (Ky. 107) Road, 0.388 mi., S 71 (2), Christian Co.;

Ky.—**Kelly Constr. Co., Inc.**, 317 Wallo Ave., Louisville, Ky., LB **$110,582** (2 bidders), b. conc. surf., Class I, 17.787 mi., SP Group 28, Pulaski Co.;

Ky.—**Sharon Constr. Co.**, Beaver Dam, Ky., LB **$149,017**, (6 bidders), bank or creek grav. 1.714 mi., SP 42-238, The Folsomdale and Symsonia Road, S-463 (2), Graves Co. CD 4/15.

▲† **National Valve & Mfg. Co.**, 3101 Liberty Ave., Pittsburgh, Pa. CA **$3,000,000**. installing principal piping sys. and appurtenances for Gallatin Steam Plant Units 3 and 4, TENNESSEE. Tennessee Valley Auth., New Sprankle Bldg., Knoxville, Tenn. Awarded May 1.

BUILDINGS—LB & CA

† **John G. Grimberg Co., Inc.**, 7624 Old Georgetown Rd., Bethesda, Md., LB **$128,800** alt. addn. **$28,500** (5 bidders) imprv. HEATING PLANT D. C. Reformatory, LORTON, VA. D. C. Govt. Dir. Bldgs. & Grounds, 499 Pa. Ave. N.W., Wash., D. C. Bids May 2. CD 4/19.

C. T. Wilson Constr. Co., 321 W. Geer St., Durham, N. C., CA **$993,440**. renovation WARD BLDGS., BUTNER, N. C. State Bd. Control, State Capitol, Raleigh, N. C. CD 4/22, under LB.

Geo. W. Kane, 111 Corcoran St. Bldg., Durham, N. C., CA **$147,850**. FACTORY addn., DURHAM, N. C. Liggett & Myers Tobacco Co., Main St., Durham, N. C. Harris & Pyne, Durham, N. C., engrs.-archts.

† **R. T. Burney, Inc.**, Wilmington, N. C., LB **$155,327** (5 bidders) Sch. 1, ARMY RESERVE TRAINING CENTER, WILMINGTON, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids May 1. CD 3/21.

▲ **Daniel Constr. Co.**, Liberty Life Bldg., Greenville, S. C. CA **$2,218,720**. 4 BLDGS. incl. 3 dormitories, dining hall, GREENVILLE, S. C. Furman University, Greenville, S. C. Bids Apr. 23, awarded Apr. 30. CD 4/11.

▲† **Smith & Turley Co.**, 1955 Poplar St., Memphis, Tenn., CA **$2,511,192**, 160-unit Capehart family HOUSING, U. S. Marine Corps Supply Center, NBy 10234, Spec. 10234/56, ALBANY, GA. P. Wks. Office, Bldg. 13, U. S. Naval Base, Charleston, S. C. Bids Mar. 5. CD 3/12, under LB.

Robert O. Bradley & Co., 110 Radium Springs Rd., Albany, Ga., LB **$399,900**. GA 96-7, GA 96-8, low-rent HOUSING, CAMILLA, GA. Camilla Housing Auth., Camilla, Ga. Bids Apr. 30. CD 4/11.

McDonough Constr. Co., 7 Baltimore Pl. N.W., Atlanta, Ga., LB **$203,000**. HEADQUARTERS FACILITIES, MARIETTA, GA. Cobb County Electric Membership Corp., Marietta, Ga. Bids Apr. 30. Southern Eng. Co. & Harry E. Roos, Jr., 1000 Crescent Ave. N.E., Atlanta, Ga., archts. CD 11/9, under Unclassified, Georgia.

▲ **Batson-Cook Co.**, Box 151, West Point, Ga., LB **$4,054,995**, Northeast Florida State MENTAL HOSPITAL, MacCLENNY, FLA. Bd. Comrs. State Institutions, Floridian Room, Roosevelt Hotel, Jacksonville, Fla. Bids Apr. 26. CD 4/5.

▲ **Bradford Builders, Inc.**, 1101 Lincoln Rd., Miami Beach, Fla., CA **$1,699,000**. Norland JUNIOR-SENIOR HIGH SCHOOL, 1050 N.W. 195 St., MIAMI, FLA. Dade Co. Bd. P. Instruction, 275 N.W. 2 St., Miami, Fla. Bids Apr. 17, awarded May 1. CD 4/24, under LB.

▲ **Giller & Fryd Constr. Corp.**, 523 Michigan Ave., Miami Beach, Fla., LB **$1,654,400**. Palmetto JUNIOR-SENIOR High SCHOOL, S.W. 120 St. and S.W. 77 Ave., MIAMI, FLA. Bd. P. Instruction, Dade Co. 275 N.W. 2 St., Miami, Fla. Bids May 1. CD 4/10.

Wesley of Florida, Inc., 222 W. Beaver St., Jacksonville, Fla., LB **$274,300**. 1 story, 169x266 ft. WAREHOUSE and OFFICE, 6201 N.W. 36 Ave., MIAMI, FLA. Florida Metals, Inc., 3690 N.W. 52 St., Miami, Fla. Wells & Taylor, 320 Wilkinson Dr. S.E., Atlanta, Ga., archts.

C. R. Wheler, Builder, 810 N.W. 72 St., Miami, Fla., LB **$158,000**. 3 story, 50x92 ft., concrete block, brick facing BREWING BLDG. addn., MIAMI, FLA. American Brewing Co., 637 N.W. 13 St., Miami, Fla. Carl H. Blohm, 1258 S.W. 3 St., Miami, Fla., archt. Jorgensen & Schreffler, 1200 S.W. 1 St., Miami, Fla., engrs.

Witters Constr. Co., 1397 S.E. 10 Court, Hialeah, Fla., CA **$750,000**. West Hollywood SHOPPING CENTER, West Dixie Hy. south of here, WEST HOLLYWOOD, FLA. Food Fair Properties, Inc., 99 Park Ave., New York, N. Y. Bids Apr. 8. CD 5/1, under LB.

O'Rourke Constr. Co., P.O. Box 7557, Houston 7, Tex., CA Est. **$500,000**. OFFICE, LAKE CHARLES, LA. Petroleum Chemicals, Inc., Factors Bldg., New Orleans, La. Bids Apr. 9. CD 3/29.

† **J. A. Baker Constr. Co.**, 112 19 Ave., Nashville, Tenn., LB **$557,200**. 35 HOUSES, ENG-40-058-57-35, FORT CAMPBELL, KY. U. S. Eng., 306 Federal Bldg., Nashville, Tenn. **Bids Apr. 29. CD 4/23.**

Clark Constr. Co., 1919 Parrish Ave., Owensboro, Ky., CA **$674,400** (5 bidders) HOSPITAL addn., OWENSBORO, KY. Owensboro-Daviess County Hospital, Owensboro, Ky. Bids Apr. 30, awarded May 1. CD 4/18.

Hines & Todd, Science Hill, Ky., LB **$370,815** (9 bidders) general and mechanical contracts, 3 story, bsmnt., brick HOSPITAL addn., PINEVILLE, KY. Pineville Community Hospital, Pineville, Ky. **Bids Apr. 30.** CD 4/3

† **U. S. Atomic Energy Comn.**, Oak Ridge, Tenn., rejected bids Apr. 23. Oak Ridge MUNICIPAL BLDG., OAK RIDGE, TENN. LB **$501,338**. Will re-advertise. CD 4/30, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Ind., Indianapolis**—BA 5/21—Bd. Sanitary Comrs., James C. Courtney, pres., 421 N. Penn. St., Contr. 55-si-13-mh, E. White River interceptor sewer. $1,225,000. Plans deposit $100. Moore & Heger, 810 N. New Jersey St., engrs. CD 8/4/54.

O., **Youngstown**—BA 5/22—Comrs. Mahoning Co., County Office Bldg., 21 W. Boardman St., reconstr. superstructure and floor, Spans 22 to 14 (inclusive) and repairs for sub-structure on Center St. Bridge No. 3, Rd. 313. Plans deposit $5. Samuel Gould, Jr., 940 Beard Den Rd., Youngstown, Jr., co. engr. CD 3/14.

Wis., **Wauwatosa**—BA 5/23—City, City Hall, bit. surf. 11 projects. F. H. Buckuck, city engr.

Wis., **Milwaukee**—BA 5/27—Sewerage Comn. of City of Milwaukee, Jones Island, 2 sludge dryers Unit substation and high voltage tie in lines. $114,000. Plans deposit $5 each. Raymond D. Leary, ch. engr. CD 12/28.

▲ Ill., **Chicago**—BA 5/29—City, City Hall, Northwest Superhighway Route, grade separation at C. & N.W. R.R. and W. Kinzie St. to Hubbard St. $3,500,000. CD 2/13/45.

† O., **Columbus**—QUARTERS—BA On Or About 5/29—U. S. Eng., P.O. Box 2127, Huntington 18, W. Va., officers quarters, men, Lockbourne Air Force Base. Serial No. ENG 46-022-57-34. CD 12/13, under LB. Bids 12/6 repected.

† O., **Mansfield**—CHECKOUT, etc.—BA 6/4—U. S. Eng., P.O. Box 2127, Huntington 18, W. Va., rocket storage checkout and assembly bldg., Air National Guard, Mansfield Municipal Airport, ENG-46-022-57-32, Extended date. CD 4/30.

BUILDINGS—BA

Ill., **Chicago**—SCHOOL, etc.—BA 5/20—Bd. Educ., 228 N. La Salle St., Charles Carroll Elementary School and gymnasium, 83 St. and Richmond Ave. Perkins & Will, 309 W. Jackson Blvd., archts. CD 7/23.

▲ Mich., **Southfield**—ACCOUNTING—BA 5/22—Michigan Bell Telephone Co., 1365 Cass St., Detroit, Zone 26, disbursement and accounting bldg., Southfield and James Couzens Rds. $2,250,000. Smith, Hinchman & Grylls Assoc., Inc., 800 Marquette Bldg., Detroit, archts. CD 5/4.

O., **Lorain**—SCHOOLS—BA 5/28—Bd. Educ., 1020 Seventh St., Jane Lindsay Elementary School, $350,000. Plans deposit $35, general. Plans deposit $30 for mechanical. CD 5/3; Irving School addn., $350,000. Plans deposit $30, $25 for mechanical work. Fulton Del Motte & Assocs., 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 2/18.

O., **Reynoldsburg**—SCHOOL—BA 5/28—Bd. Educ., R. C. Mobberly, supt., Reynoldsburg, French Run school, adjoining French Run Creek, east of Brookside addn. $485,000. CD 5/3.

O., **Columbus**—SCHOOL—BA 5/29—Scioto-Darby Bd. Educ., Scioto and Darby Creek Rd., Hilliard High School addn. and gymnasium, $530,000. Kellam & Foley, 1857 Northwest Blvd., archts.

▲ Ill., **Wilmette**—SCHOOL, etc.—BA 6/4—School Dist. 39, 738 10 St., Wilmette, elementary school, gymnasium and auditorium between Locust and Romona Rds. $1,250,000. Ganster & Henninghausen, 222 Washington St., Waukegan, archts. CD 1/23.

O., **Cuyahoga Heights**—SCHOOL—BA 6/4—Cuyahoga Heights Bd. Educ., 4820 E. 71 St., Cleveland, Zone 25, Cuyahoga Heights High School addn., $585,000. Plans deposit $35. Fulton, DelaMotte & Assocs., 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 11/9.

O., **Willoughby**—SHOP—BA 6/4—Willoughby-Eastlake Bd. Educ., 4284 Center St., shop addn. to North High School. $570,000. Plans deposit $20. Outcalt, Guenther & Assoc., 13124 Shaker Sq., Cleveland, Zone 20, archts. CD 4/16.

▲ O., **Vandalia**—SCHOOL—BA 6/11—Bd. Educ., Butler Twp. School Dist., R. A. Francis, supt., Vandalia, high school. $1,250,000. W. N. Wurst 4699 Salem Ave., Dayton, archt. CD 5/15.

Wis., **Stevens Point**—DORMITORY—BA 6/12—Wis State College Bldg. Corp., Madison, 3 story dormitory Schubert, Sorenson & Assocs., 308 Hoeschler Bldg., La Crosse, archts. CD 2/15/56.

▲ Wis., **Madison**—CHADBOURNE HALL—BA 6/13—University of Wisconsin Bldg Comn., Madison, three 11 story, bsmnt. wings to form V dormitory for women, Chadbourne Hall. $2,415,000. Plans deposit $50. Roger S. Kirchhoff, state archt. R. D. Culbertson, state engr. CD 11/13.

HEAVY CONSTRUCTION—LB & CA

OHIO—State Dpt. Hys., Columbus, Zone 15, Bids opende 4/30,

O.—**Ohio Road Paving Co.**, 30 E. Broad St., Columbus, O., LB **$95,672**, est. $93,080 (1 bidder), Type T-30, T-35 and B-35, 10.143 mi. Crawford Co.; LB **$86,392**.

est. $86,110 (2 bidders) Type T-30 and T-35, 10.8 mi. Mahoning and Trumbull Counties.

O.—**The W. J. Seidensticker Co.**, 3585 E. Fulton St., Columbus, O., LB **$136,936**, est. $170,200 (6 bidders) Type T-35 and structure, 0.303 mi. SR 317-3.16, (Village of Gahanna), Franklin Co.;

O.—**Arthur S. Langenderfer, Inc.**, 4690 W. Bancroft St., Toledo, Ohio, LB **$162,825**, est. $175,800 (1 bidder) Type T-35, 1.687 mi. SR 110-(0.57-1.24) City of Napoleon), Henry Co.;

O.—**Fenton Constr. Co.**, P. O. Box 310, Ashland, O., LB **$257,948**, est. $300,200 (5 bidders) Parts I and 2, Type T-35, 9.446 mi., U. S. R 40-3.08, Madison Co.;

O.—**H & S Contracting Co.**, 3585 E. Fulton St., Columbus, O., LB **$95,563**, est. $103,320 (2 bidders), Type 30 and T-35, 12.41 mi. Highland Co.;

O.—**The McCourt Constr. Co.**, 720 Home Ave., Akron, O., LB **$75,403**, est. $84,730 (2 bidders) Type T-30, T-35 and B-35, 9.71 mi. Portage Co. CD 4/9.

C. A. Agresta Constr. Co., 4186 Greenvale Ave., Cleveland 21, O., LB **$334,142** (3 bidders) widening Cedar Rd. to 4 lanes from Warrensville Center to Green Rds., CLEVELAND, O. Comrs. Cuyahoga Co., Court House, Cleveland 13, O. Bids May 2. CD 4/25.

Encrete, Inc., 2360 Dorothy Lane, Dayton, O., LB **$308,000**, est. $483,000 (7 bidders) Beavercreek Sewage Disposal plant incl. 2 primary tanks, 2 secondary tanks and 2 aeration tanks and piping, etc., DAYTON, O. Comrs. Montgomery Co., Court House, Dayton, O. Bids Apr. 30. CD 3/19.

INDIANA—State Hy. Dpt., State House Annex, Indianapolis, Bids opened 4/30,

Ind.—**C. B. Cochran**, Indianapolis, Ind., LB **$94,063** (4 bidders) Contr. No. 4024, bridge over Mississinew River, F-130, Delaware Co.

Ind.—**DeBolt Constr. Co.**, Richmond, Ind., LB **$176,855** (5 bidders) Contr. 4122, abutment exten. over Nolands Branch, and bridge over Nolands Fork, S-81 (5), Wayne Co.;

Ind.—**J. L. Wilson**, Bloomfield, Ind., LB **$302,980** (4 bidders) Contract No. 4123 bridge over Spring Creek; bridge over Hungry Hollow Creek, approaches, etc. F-95 (7), Warren Co.;

Ind.—**Kahl & Mahon**, Liberty, Ind., LB **$96,319** est. $110,488 (9 bidders) Contract No. 4124, bridge over Turkey Creek, approaches, etc. F-95 (6), Warren Co. CD 4/15.

▲ **INDIANA**—State Hy. Dpt., State House Annex, Indianapolis, Bids opened Apr. 30,

Ind.—**Reith-Riley Constr. Co.**, Goshen, Ind., LB **$216,214** est. $260,436 (9 bidders) bit. base wid'n., resurf. 6.67 mi. SR 135, Contr. RS-4112, S-300 (2) Morgan and Johnson Counties; LB **$547,984** est. $614,300 (11 bidders) bit. base wid'n., resurf. 16.93 mi. bit. with conc. base 0.718 mi. SR 47 RS-4113, Proj. S-390 (1), Darke and Montgomery Counties; LB $171,520 (1 bidder) paving, grading, drainage, 1.003 mi. Road 30, R-4117, Part "B" F-66 (2), Kosciusko Co.;

Ind.—**The Hunt Paving Co. Inc.**, Indianapolis, Ind., LB **$186,773** (2 bidders) paving, grading, drainage 0.944 mi. Road 67, R-4114, F-72 (12), Delaware Co.;

Ind.—**L. H. Gunsaullus & Son**, Kendallville, Ind., LB **$555,294**, est. $589,466 (9 bidders) paving, grading, drainage 6.213 mi. Road 236 R-4115, S-368 (3), Parke and Montgomery Counties;

Ind.—**Magaw Constr. Co.**, Richmond, Ind., LB **$525,432** (3 bidders) paving, drainage grading 4.791 mi. Road 27, R-4166 F-402 (10) Wayne Co. CD 4/11.

▲ **Comrs. Marion Co.**, Court House, Indianapolis, Ind., Own Forces, **$1,000,000**. resurf. more than 100 mi. county roads, incl. some asph. paving, INDIANAPOLIS, IND.

Woodruff & Sons, E. Michigan St., Michigan City, Ind., LB **$80,960**, sanitary sewers J, K and L Sts., LA PORTE, IND. City, City Hall, Laporte, Ind. Bids Apr. 29. CD 4/29.

Lutgring Bros., Inc., R.R. No. 1, Tell City, Ind., CA **$133,061**, sanitary sewers in South Area, North Area and East Area, TELL CITY, IND. City, City Hall, Tell City, Ind. Bids Apr. 9. CD 3/27.

▲ **ILLINOIS** — Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago, Bids opened 5/21,

ISTHC—**Contracting & Material Co.**, 1235 Dodge St., Evanston, Ill., and **Kenny Constr. Co.**, 3220 Oakton St., Skokie, Ill., and **Louis Garavaglia, Centerline, Mich.**, LB **$9,729,165** (4 bidders) Contr. T-9-A and T-9-B combination, grading, drainage, paving appurtenances, erecting precast concrete and steel bridges, 4.39 mi. Touhy Ave. northerly to Golf Rd.

ISTHC—**Peter Kiewit Sons Co., Condon Cunningham Co. & Paschen Contrs, Inc.**, 4229 Lafayette Ave., Omaha, Neb., LB **$8,371,041** (4 bidders) Contr. T-1-C, grading, drainage, paving, appurtenances, bridges 5 mi. near Wood Blvd. extending westerly to Chicago Rock Island & Pacific Ry. CD 4/15.

Azarelli Constr. Co., P. O. Box 132, Kankakee, Ill., LB **$134,364**, sanitary sewers, water distr. sys., asph. surf. and concrete sidewalks, BOURBONNAIS, ILL. Village, Village Hall, Bourbonnais, Ill. Warren & Van Praag, Inc., 253 S. Park St., Decatur, Ill., engr.; **Ray J. Benoit, Inc.**, P. O. Box 168 Kankakee Ill., LB **$127,436**. sewge treatment plant (Bourbannis, Ill.).

George D. Hardin, 2130 S. Michigan Ave., Chicago, Ill., CA **$137,297**, sewage collection sys. and lift station Northfield Woods Sanitary Dist., CARY, ILL. Village, Village Hall, Cary, Ill. Bids Feb. 15. CD 1/15.

City, Alvin G. Fields, mayor, City Hall, East St. Louis, Ill., Own Forces, **$250,000**. repairs, resurf. various streets and alleys, EAST ST. LOUIS, ILL. CD 1/7/52.

▲ **Bd. Harbor Comrs.**, City Hall, Milwaukee, Wis., rejected bids Apr. 16, bulkhead, dredging and backfill S. Pier No. 2, MILWAUKEE, WIS. LB **$3,666,600**. CD 4/22, under LB.

Highway Pavers, 10815 W. Watertown St., Plant Rd., Milwaukee, Wis., CA **$287,239** (4 bidders) asph. paving N. Van Buren St., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids Apr. 26, awarded May 1. CD 4/23;

Alto, Inc., 2637 S. Shore Dr., Milwaukee, Wis., CA **$130,387** (5 bidders) paving W. Ohio Ave. and N. 40 St. (Milwaukee, Wis.).

Klug & Smith Co., 4425 W. Mitchell St., Milwaukee, Wis., LB **$98,800** (4 bidders) return sludge pumping station, MILWAUKEE, WIS. Sewerage Comn. of City of Milwaukee, Jones Island, Milwaukee, Wis. Bids Apr. 29. CD 3/27.

W. J. Lazynski, Inc., 4445 N. 124 St., Milwaukee, Wis., CA **$100,378**, sewers in S. 51 St., MILWAUKEE, WIS., City, City Hall, Milwaukee, Wis. Bids Apr. 25, awarded Apr. 29.

Streu Constr. Co., Two Rivers, Wis., CA **$77,125** paving 7 streets, TWO RIVERS, WIS. City, City Hall, Two Rivers, Wis. Bids Apr. 16.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Denton Constr. Co., 20415 Mack Ave., Grosse Point, Mich. CA **$1,665,841**, est. $1,700,000 grading, drainage structures and 9 in. 24 ft. dual concrete pavement 3.286 mi. Reloc. M-69 north to US-12 F-38061 C1-R (F 436 1). Bids Apr. 17. CD 4/24, under LB.

▲ **O. W. Burke Co.**, 1032 Fisher Bldg., Detroit, Mich., CA **$9,796,000**, filter bldg., service bldg., settling basins, connection conduits, Constr. SE-12, Springwells Station, Warren Ave., DETROIT, MICH. City, Water Bd., 735 Randolph St., Detroit, Mich. Bids Apr. 30. CD 3/21.

R. E. Daily Co., 9900 Northlawn, Detroit, Mich., CA **$403,000**, water treatment plant, HIGHLAND PARK, MICH. City, 30 Gerald St. Highland Park, Mich. CD 3/20/56.

Lewis Keforkian, 204 Ferry Ave., Pontiac, Mich., CA **$50,965**, water mains, valves, hydrants etc., PONTIAC, MICH. City, Ada Evans, city clk., Pontiac, Mich. Bids Apr. 8. CD 4/1.

▲† **J. S. Fredman, Inc.**, 735 South Paddock St., Pontiac, Mich., **$1,879,444**, troop and tactical facilities, vicinity of MONROE, MICH. U. S. Eng., 600 East Jefferson Ave., Detroit, Mich. Bids Apr. 11. CD 4/1.

A. Z. Shmina & Sons, Co., 4125 Longacre St., Detroit, Mich., CA **$599,900**, swimming pool and auditorium addn., Wayne Memorial High School, WAYNE, MICH. Wayne Community School Dist. Bd. Educ., 3714 S. Wayne Rd., Wayne, Mich. Grand total $864,307. Bids 4/8. CD 4/19.

United Heat Eng., 17129 Rockdale St., Detroit, Mich., CA **$163,896** mechanical work for swimming pool and auditorium addn., Wayne Memorial High School (Wayne, Mich.).

E. H. Dean Electric Co., 14 Smith St., Detroit, Mich., CA **$101,407** electrical work for swimming

(Continued on page 139)

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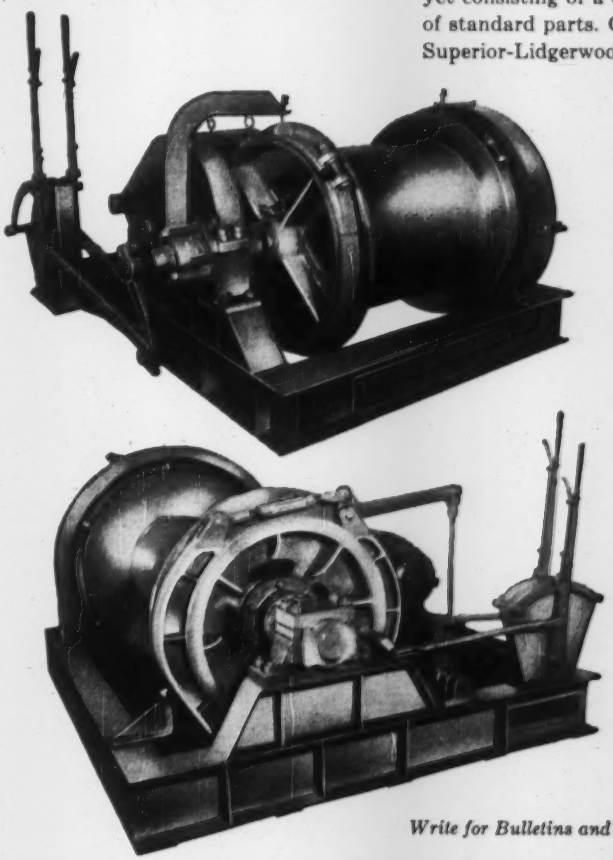

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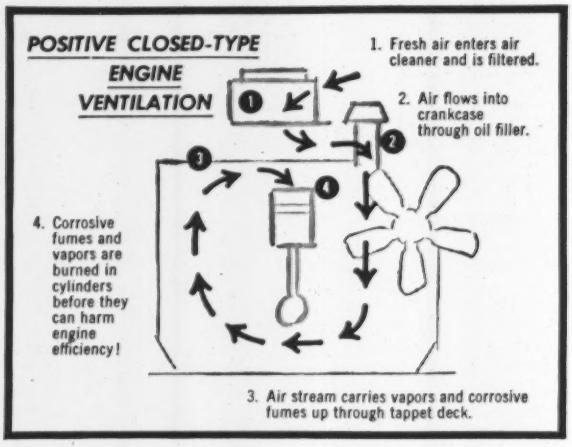
"CLEAN LIVING" GIVES A CHEVY ENGINE LONGER LIFE!

...more evidence that Chevrolet Task-Force trucks are engineered better and built better for bigger savings!

This drawing shows, roughly, one of the ways in which Chevrolet truck engines minimize a major cause of wear—dirt! Now consider this additional evidence that Chevy heavy-duty V8's and 6's "live clean" and bring you fleet, dependable power that costs less to use!


POSITIVE CLOSED-TYPE ENGINE VENTILATION
1. Fresh air enters air cleaner and is filtered.
2. Air flows into crankcase through oil filler.
3. Air stream carries vapors and corrosive fumes up through tappet deck.
4. Corrosive fumes and vapors are burned in cylinders before they can harm engine efficiency!

Extra filters give extra-clean fuel—Only *clean* fuel reaches the engine—that's one reason you can depend on a Chevrolet truck! All fuel is filtered twice (once in the fuel tank and again in the carburetor) to keep dirt and water from hampering efficient operation. Chevrolet truck V8's *provide* a *third* filter, at the carburetor, for triple protection!

Oil stays clean longer, too—Chevrolet truck V8's and 261-cu.-in. 6's come equipped with modern high-capacity oil filters (V8 filters are of the Full-Flow type). These engines keep *clean* oil flowing to moving parts; parts wear less and last longer because of it!

Even the air is cleaner—Dust and foreign matter in the air an engine "breathes" can reduce engine life by years. Chevrolet minimizes this wear-producing factor by providing big oil-bath air cleaners as *standard equipment* on all truck engines.

These are sound under-the-hood reasons why a Chevrolet truck will *stay* on your job and *save* on your job. There are others, too, including short-stroke V8 design (shortest stroke of any truck V8's!) and 6-cylinder engine design that puts out more power than any other in the field. You'll learn about them all when you visit your Chevrolet dealer. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Biggest sellers . . . because they're biggest savers!

CHEVROLET TASK·FORCE 57 TRUCKS

(Continued from page 137)

pool and auditorium addn., Wayne Memorial High School, (Wayne, Mich.)

BUILDINGS—LB & CA

Howard Johnson's Restaurant, 7800 Reading Rd., Cincinnati, O., rejected bids Apr. 29, U-shaped MOTEL in rear of present restaurant, CINCINNATI, O. Est. $350,000. CD 4/10.

▲ **H. W. Miller Constr. Co.,** 1511 Neave St., Covington, Ky., CA $1,173,000. 4 deck, concrete PARKING GARAGE, 6 and Elm Sts., CINCINNATI, O. City, City Hall, Cincinnati, O. Bids Apr. 9, awarded May 2. CD 4/25, under LB.

General Maintenance & Eng. Co., 1231 McKinley Ave., Columbus, O., CA Est. $150,000. 1 story, 7,200 sq. ft., brick, stone, ELECTRONIC RESEARCH LABORATORY at Kenny and Henderson Sts., COLUMBUS, O. Wittenberg College, Springfield, O. Power Equipment Co., Galion, lessee. Freshwater & Harrison, 3763 N. High St., Columbus, archts.

Robert W. Setterlin & Sons Co., 2000 Kenny St., Columbus, O., LB $891,785, LAW LIBRARY and OFFICE addn., at Ohio State University, COLUMBUS, O. Ohio State University, N. High St., Columbus, O. Bids May 1. CD 4/11.

Edward J. De Bartolo Co., 2620 Market St., Youngstown, O., CA, Est. $350,000. 2 story, bsmnt., 36,000 sq. ft., brick stone OFFICE BLDG. with black-top paved parking area, State Rd. and Chamberlain Ave., CUYAHOGA FALLS, O. Ohio Bell Telephone Co., Carl Boyer, 50 W. Bowery St., Akron, O.

B. G. Danis Co. Inc., 1518 E. 1 St., Dayton, O., LB $477,864 general contract Shoup Mill Elementary SCHOOL, DAYTON, O. Bd. Educ., 348 W. First St., Dayton, O. Bids Apr. 24. CD 4/3.

Fred W. Entenman, Inc., 3323 Secor Rd., Toledo, O., CA $403,600 general contract Larchmont SCHOOL, TOLEDO, O. Bd. Educ., Linwood and Southard Sts., Toledo, O. Bids Apr. 16, awarded May 1. CD 3/28.

Henry J. Spieker Co., 1418 Elm St., Toledo, O., CA $513,400, general contract Elmhurst SCHOOL, TOLEDO, O. Bd. Educ., Linwood and Southard Sts., Toledo, O. Bids Apr. 23. CD 3/28.

Algot B. Larson, 3837 W. Lake St., Chicago, Ill., CA $177,000. 1 story, brick WAREHOUSE and OFFICE, 2624 W. Addison St., CHICAGO, ILL. Planters Nut & Chocolate Co., 509 E. Illinois St., Chicago, Ill. E. F. Quinn, 134 N. La Salle St., Chicago, Ill., archt.

▲ **James Nielsen,** 9425 S. Country Club St., Chicago, Ill., CA $1,000,000. 1 story, brick SUPER MARKET, 10601 S. Pulaski Rd., CHICAGO, ILL. John Gremer, 9137 Richmond St., Chicago, Ill. Albert Sachtleben, 7923 S. Halsted St., Chicago, Ill., archt.

▲ **Geo. Sollitt Constr. Co.,** 109 N. Dearborn St., Chicago, Ill., CA $1,000,000. 4 story brick, metals RESEARCH BLDG. addn., 3350 S. Federal St., CHICAGO, ILL. Armour Research Foundation, Ill. Institute of Technology, 3300 S. State St., Chicago, Ill. Bids Feb. 27. CD 2/4.

▲ **Comet Constr. Co.,** 1848 N. Milwaukee Ave., Chicago, Ill., Own Forces, $1,750,000. Comet Gardens SHOPPING CENTER, incl. paving, sewers, water mains, parking, Northwest Hy., Hicks Rd.-Robertson Ave., PALATINE, ILL. CD 10/1.

Hoeppner-Bartlett Co., 631 E. Madison St., Eau Claire, Wis., LB $366,534 (4 bidders) general contract DORMITORY, EAU CLAIRE, WIS. Wisconsin State College Bldg. Corp., Madison, Wis. Bids Apr. 25. CD 3/27.

Paradise Building Co., 22176 Melrose Court, East Detroit, Mich. CA Est. $760,000, 48 brick split level HOUSES, EAST DETROIT, MICH., Froling Realty Co., Roseville, Mich.

Atkin-Fordon Co., 7360 West Chicago St., Detroit, Mich., CA $403,243, Elementary SCHOOL, Greenacres, WARREN, MICH. Bd. Educ., Warren Consolidated Schools, 5460 Arden St., Warren, Mich. Bids Apr. 23. CD 4/12.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Iowa, Sibley—BA 5/21—City, sewage works. $75,000. Buell & Winter Engineers, 513 Insurance Exchange Bldg., Sioux City, engrs.

Kan., Haviland—BA 5/23—City, Mrs. Myrtle Cooke, clk., City Hall, sewerage sys. imprvs., incl. (A) sewage treatment plant (B) 32,700 lin. fft. 8 in. vitr. clay sanitary sewers, trenching and backfilling, 83 manholes, 26 flushing manholes, etc. $75,000. Plans deposit $10. Ediger Eng. Co., 252 Laura St. and P.O. Box 145, Wichita, engr.

† **Nebraska**—BA 5/23—U. S. Eng., 1709 Jackson St., Omaha, repairing dikes and revetment Missouri River, Ponca-Upper Sioux City Bends, near Ponca, Inv. 25-066-57-107.

† **Nebraska**—BA 5/27—Soil Conservation Service, 134 S. 12 St., Lincoln, Neb., grade dam, Upper Salt Creek Watershed, near Cheney, Lancaster Co., No. 31-NB-57. CD 7/20/53.

† **Colo., Colorado Springs**—BA On Or About 5/28—Contg. Officer, Air Force Academy Constr. Agency, P. O. Box 1670, Colorado Springs, grading, drainage roads in Community Area and Road 62, IFB 05-613-57-42. Plans deposit $20. CD 8/5/54.

† **Colo., Colorado Springs**—BA 5/28—Dpt. Air Force, Box 1670, Colorado Springs, paving, curbs and gutters for Air Force Academy, IFB 05-613-57-32. Extended date. Skidmore, Owings & Merrill, 3333 N. El Paso St., engrs. CD 3/26.

JAMES McHUGH Construction Co.—C. E. YOUNGDAHL & COMPANY
General Contractors
4949 SOUTH PARK AVENUE • CHICAGO 15, ILLINOIS

January 9, 1957

Georgia Pacific Plywood Company
270 Park Avenue
New York, New York

Gentlemen:

The Stateway Gardens Project consists of six 17-story and two 10-story apartment buildings. This calls for 1,100,000 sq. ft. reinforced concrete ceilings and 1,200,000 sq. ft. reinforced concrete walls, for which we plan on using 150,000 sq. ft. of GPX plastic coated concrete form plywood manufactured by the Georgia Pacific Plywood Company. The buildings, designed by Holabird & Root & Burgee, are unique, in that no columns or beams are used. The concrete walls constitute the supporting members.

Experience has proved to us that the many re-uses we get from GPX far exceeds what we might get with another form material. In addition, the smooth, uniform, concrete surface requires a minimum of pointing and no further finishing. The concrete surface will be painted, thus eliminating a costly plaster job.

GPX thus affords us a considerable economic savings in addition to the many other advantages.

Very truly yours,

JAMES McHUGH CONSTRUCTION CO.-
C. E. YOUNGDAHL & COMPANY

D. W. Rankford

DWR:ms

1 sq. ft. of GPX concrete form

covered every 17 sq. feet of surface concrete in Chicago's $12,000,000

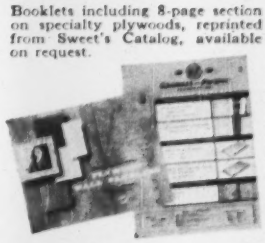
STATEWAY GARDENS

Between State Street and the New York Central Railroad, from 35th to 39th Streets, a city within a city is rising. Stateway Gardens, with its parks, apartments and schools, will bring a better way of living to hundreds of Chicago families. It is a story of architecture, engineering and concrete. Concrete poured, stripped and poured again in the same lightweight, plastic-surfaced plywood forms. GPX Concrete Form was reused here 17 times and the same handy panels will serve many future assignments, each resulting in smo-o-o-th concrete, requiring little or no finishing.

Unretouched closeup of wall shows concrete condition immediately after stripping away forms. GPX Concrete Form absorbs practically no water, strips easily.

Send for literature: GPX CONCRETE FORM

Booklets including 8-page section on specialty plywoods, reprinted from Sweet's Catalog, available on request.



GEORGIA—PACIFIC
CORPORATION
60 East 42nd Street, New York 17, N. Y. ENR 557
Please send me free literature on GPX Concrete Form.

NAME_____
ORGANIZATION_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

Get all the facts. Write for Bulletin

- **TAILOR MADE**—for most economical installation.
- **RIGID STRENGTH**—sturdy resistance-welded construction.
- **LIGHT WEIGHT**—for greater load bearing capacity
- **SELF-CLEANING**—for reduced maintenance costs.
- **OPEN CONSTRUCTION**—gives maximum ventilation and illumination.

Ask for Bulletin E-47

ROCKWELL SRA

ROCKWELL SPRING & AXLE CO.
Standard Steel Spring Division
4004 EAST SEVENTH AVE., GARY, INDIANA

ADVERTISEMENT FOR BIDS

Northern Illinois Toll Highway

Bids to be opened June 6, 1957

CONTRACT E-1A

The work to be done under this Contract shall be completed in three hundred eighty (380) calendar days after the date specified in the Notice to Proceed, and consists of: The grading, drainage, paving, the construction of appurtenances and the erection of precast concrete and steel bridges for approximately 3.67 miles of the Northern Illinois Toll Highway in Construction Section E-1A, in Kane County, Illinois.

The approximate quantities for the principal items of work are:

Roadway Excavation	518,000 C.Y.
Borrow	103,000 C.Y.
Selected Subgrade	80,000 C.Y.
Granular Subbase	43,400 C.Y.
10" Reinforced PCC Pavement	127,700 S.Y.
3" Bituminous Concrete Shoulders	75,000 S.Y.
Structure Concrete	2,920 C.Y.
Reinforcing Steel	375,000 Lb.
Structural Steel (erection only)	614,000 Lb.

CONTRACT T-5A

The work to be done under this contract shall be commenced on June 30, 1957, or such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before December 15, 1958, and consists of: The grading, drainage, paving, the construction of appurtenances, and the erection of precast concrete bridges for approximately 3.458 miles of the Northern Illinois Toll Highway in Construction Section T-5A, in Lyons Township, Cook County, Illinois.

The approximate quantities of the principal items of work are:

Roadway Excavation	142,000 C.Y.
Special Excavation	280,000 C.Y.
Channel Excavation	523,000 C.Y.
Borrow	1,520,000 C.Y.
Selected Subgrade	87,200 C.Y.
Granular Subbase	44,000 C.Y.
10" Reinforced PCC Pavement	180,200 S.Y.
3" Bituminous Concrete Shoulders	55,800 S.Y.
Structure Concrete	19,900 C.Y.
Reinforcing Steel	2,470,000 Lbs.

CONTRACT T-5B

The work to be done under this contract shall be commenced on June 30, 1957, or such earlier date as may be mutually agreed upon between The Commission and the Contractor. All work under this Contract shall be completed on or before December 15, 1958, and consists of: The grading, drainage, paving, the construction of appurtenances and the erection of precast concrete bridges for approximately 1.900 miles of the Tri-State Route of the Northern Illinois Toll Highway in Construction Section T-5B, in Cook County, Illinois.

The approximate quantities for the principal items of work are:

Roadway Excavation	128,000 C.Y.
Special Excavation	104,500 C.Y.
Channel Excavation	30,000 C.Y.
Borrow	738,000 C.Y.
Selected Subgrade	57,500 C.Y.
Granular Subbase	30,100 C.Y.
10" Reinforced PCC Pavement	140,500 S.Y.
3" Bituminous Concrete Shoulders	40,000 S.Y.
Structure Concrete	4,000 C.Y.
Reinforcing Steel	530,000 Lbs.

CONTRACT T-5AB

This contract covers a combination of Contracts T-5A and T-5B taken together.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION

20 N. Wacker Drive, Chicago — **By Austin L. Wyman, Chairman**

Write, wire or phone for detailed information and necessary forms, Chief Engineer, Room 1654, 20 N. Wacker Dr., Chicago 6, Ill. Telephone FRanklin 2-7020.

† **Iowa, Sioux City**—SHELTER—BA 5/28—U. S. Eng., 1709 Jackson St., Omaha, Neb., ready aircraft shelter, Sioux City Air Force Base, Inv. 25-066-57-101. CD 8/21.

† **Nebraska**—BA 5/28—Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo., earthwork, concrete lining and structures, Franklin Canal System, near Red Cloud, Webster Co., Spec. 701C-439. CD 5-25-44.

† **New Mexico**—BA 5/28—Bureau Reclamation, Dpt. Interior, Albuquerque, earthwork, clearing and structures for irrigation, rehabilitation, Belen Unit 2, Middle Rio Grande Proj., near Isleta, Spec. DC 4909, adv. ENR 5/16. CD 9/4.

† **Texas**—BA 5/28—Soil Conservation Service, 1st. Natl. Bank Bldg., Temple, flood water retard. structs. with earthfill embankments, Site 7, Rowlett Creek of Trinity River, approx. 2 mi. south west of Wylie, Collin Co. Harold R. Baker, P. O. Box 417, Temple, engr.

† **S. D., Rapid City**—AIRCRAFT SHELTER—BA 5/29—U. S. Eng., 1709 Jackson St., Omaha, Neb., aircraft shelter, Ellsworth Air Force Base, Inv. 26-066-57-97. CD 8/21.

† **North Dakota**—BA 6/4—U. S. Eng., Riverdale, generators, Units 4 and 5 for Garrison Dam and Power Plant near Riverdale, Inv. 32-015-57-48. CD 2/15.

† **South Dakota**—BA 6/4—U. S. Eng., 1709 Jackson St., Omaha, Neb., spillway chute, Big Sioux River, Sioux Falls, Inv. 25-066-57-105.

† **N. M., Sacramento**—HOUSING—BA About 6/13—U. S. Eng., P.O. Box 1538, Albuquerque, N. M., 6-units of family housing, Sacramento Peak Air Force Station, ENG-20-005-57-83. CD 8/24.

† **North Dakota**—BA On Or About 6/13—U. S. Eng., Riverdale, reservoir access roads, Stage III, Garrison Dam and Reservoir Proj., CIVENG-32-015-57-60. CD 2/15.

▲† **Tex., Kelly Air Force Base**—BA 6/13—U. S. Eng., Box 1229, Galveston, air national guard facilities, hangar and support items (Phase II) ENG-41-243-57-46. $1,000,000-$3,000,000. CD 11/16.

† **N. M., Los Alamos**—POWER FACILITIES—BA 6/18—U. S. Atomic Energy Comn., Los Alamos, power facilities incl. 1½ mi. electric circuit, Inv. 291-57-9, $190,000-$220,000.

† **North Dakota**—BA On Or About 6/19—U. S. Eng., Riverdale, Williston Protective Works, Stage II, Garrison Dam and Reservoir Proj., Williston, CIVENG-32-015-57-59. CD 2/15.

▲† **Okla., Pyor**—FACILITIES—BA About 6/21—U. S. Eng., P.O. Box 61, Tulsa, Zone 2, nitro-guanidine facilities, Oklahoma Ordnance Works, ENG-34-066-57-55, $3,000,000-$7,000,000. Plans deposit $150.

BUILDINGS—BA

▲ **Iowa, Des Moines**—HOSPITAL—BA 5/21—Mercy Hospital, Sisters of Mercy, 420 E. Washington St., Council Bluffs, 5 story, 151x178 ft. hospital addn. also remodeling present building. $2,750,000. Brooks-Borg, 815 Hubbell Bldg., archts. CD 3/19/56.

Kan., Lawrence—HEATING PLANT—BA 5/21—Haskell Institute, Lawrence, and Bureau Indian Affairs, 3005 Central St. N.E., Albuquerque, N. M. 5,000 sq. ft., masonry, block, brick on steel frame school heating plant. Wilson & Co., 705 E. Crawford St., Salina, engrs.

Mo., Columbia—THERAPY—BA 5/23—Curators of University of Missouri, Dale Bowling, bus. mgr., 116 Jesse Hall, underground therapy dept. for teaching department of 4-year medical and surgical school, University of Missouri. Jamieson, Spearl, Hammond & Grolock, 1696 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, archts. CD 2/9/53.

Mo., St. Louis County—HEALTH CENTER—BA 5/23—St. Louis Co., Bd. P. Wks., Herman F. Wagner, secy., Clayton, Zone 5, 3 story, bsmt., brick, cut stone, rein. con. health center on grounds of St. Louis County Hospital, 601 South Brentwood Blvd. $800,000. Plans deposit $25. Jamieson, Spearl, Hammond & Grolock, 1697 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, archts. CD 7/19.

† **Minn., Faribault**—TRAINING CENTER—BA 5/28—U. S. Eng., 1217 Post Office & Custom House, 180 E. Kellogg Blvd., St. Paul, Zone 1, Army Reserve Training Center, ENG-21-018-57-17. CD 4/24.

† **N. M., Aztec**—DORMITORY FACILITIES—BA 5/29—Bureau Indian Affairs, Geology Bldg., University of New Mexico, Albuquerque, Aztec dormitory facilities. Proj. BU-603-352 (3). CD 1/15, under LB.

HEAVY CONSTRUCTION—LB & CA

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

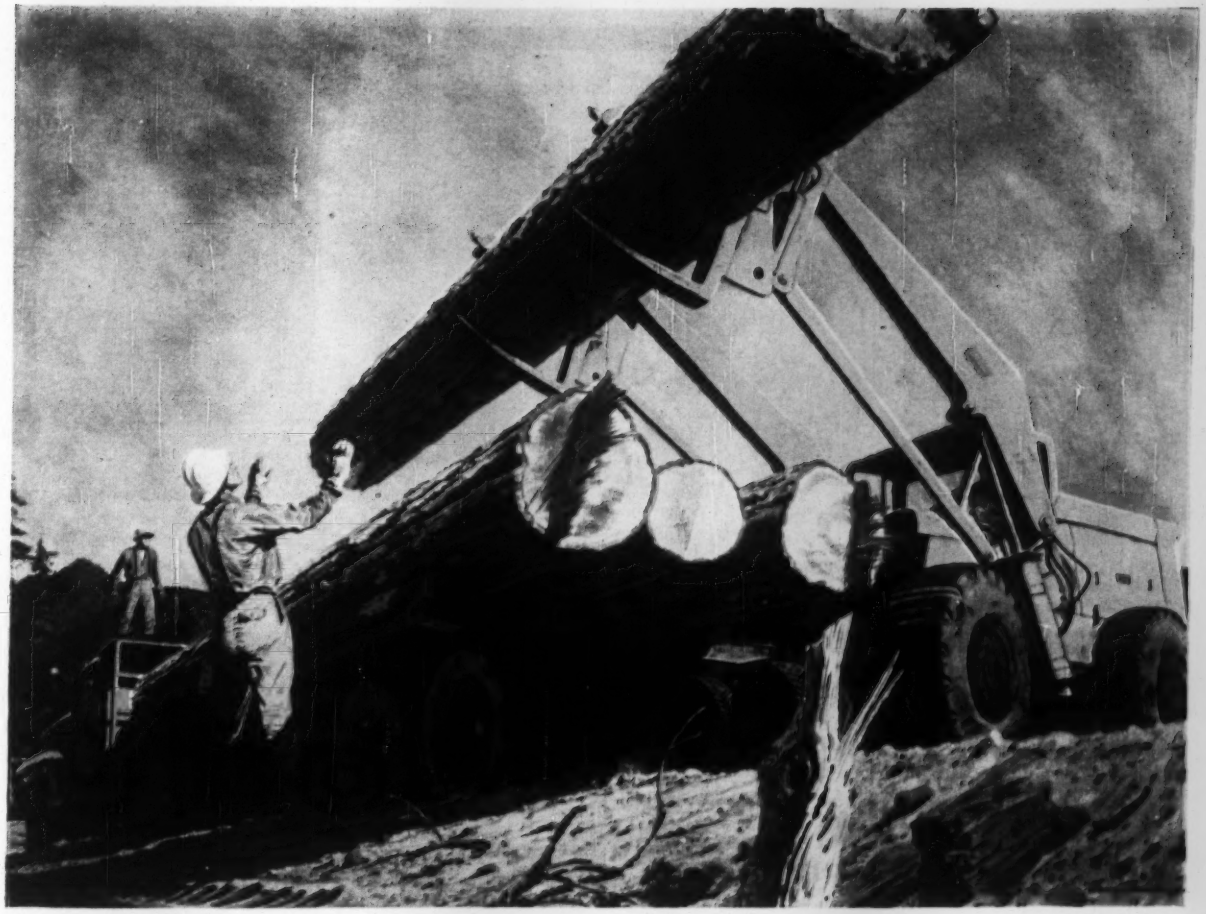
McCree & Co., Inc., New York Bldg., St. Paul, Minn. CA $523,124. grading, paving 8.5 mi. between S limits of Ormsby and TH 60, Martin and Watonwan Counties. CD 4/17, under LB.

P. Lametti Constr. Co., 615 Drake St., St. Paul, Minn., LB $621,630 (3 bidders), Sanitary Sewer Imprvt. No. 1, FALCON HEIGHTS (P.O. St. Paul), MINN. Village, C. J. Stewart, clk., Falcon Heights (P.O. St. Paul), Minn. CD 4/10.

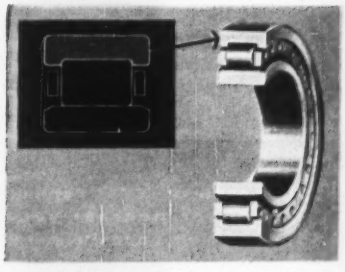
W. Mueller & Son, Hamburg, Minn. LB $76,473. subgrade, corrections, grav. base and road-mixed bit. surf. 6.9 mi. between SAR 2, 2.5 mi. south of Glencoe and east line of McLeod Co., GLENCOE, MINN. McLeod Co., Lida C. Luthens, aud., Glencoe, Minn. CD 4/15.

City, H. Erickson, engr., Minneapolis, Minn., Own Forces. $347,000. widen, pave Washington Ave. North from West Broadway to 26th Ave. North, and repave

(Continued on page 143)



Loggers' "weight-lifter" tests bearing staminal



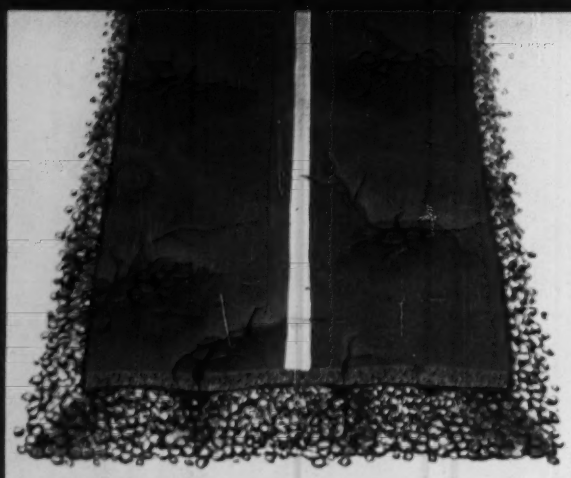
TWO-LIP RACE INCREASES RIGIDITY

Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability—keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

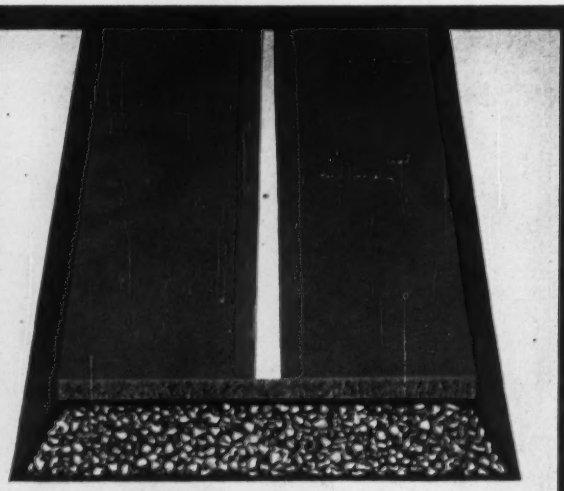
Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings.* And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

BOWER ROLLER BEARING DIVISION
FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS



When moisture invades road foundations, many aggregates will lose their initially high supporting value. Result: Surface buckles . . . cracks . . . finally fails like this.



"Cat" Asphalt with Monsanto Dry P_2O_5 seals out water, stabilizes moisture content, thereby protecting the supporting value of the base or subbase. Road surface stays smooth longer . . . *at less cost.*

Seamless "CAT" Asphalt, with Monsanto Phosphoric Anhydride (P_2O_5), waterproofs roadbeds, stops irrigation water loss, controls erosion

Water level proof! Right half of test pond shows how ¼ inch "Cat" Asphalt liner holds water, stops seepage into porous subsoil, checks erosion!

"CAT" ASPHALT also cuts airport-construction costs, seals concrete and waterproofs structural foundations. It controls grade erosion, industrial waste and ground-water pollution.

KEY INGREDIENT: Monsanto Phosphoric Anhydride (P_2O_5), catalyzes asphalt, makes it uniquely easy and inexpensive to apply. Sprayed hot, "Cat" Asphalt cools to a flexible, seamless, waterproof blanket that conforms to any contour and is not harmed by freezing, thawing, or summer heat.

Monsanto Dry P_2O_5 is also used in alkyl phosphates, fluorophosphates, phosphorus insecticides, oil additives and as a desiccant. For more information, write: MONSANTO CHEMICAL COMPANY, Inorganic Chemicals Division, Dept. ENR-1, 710 No. 12th Blvd., St. Louis 1, Missouri.

For name of "CAT" Asphalt Producer nearest you, see list on opposite page

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Where Creative Chemistry Works Wonders for You

Monsanto Lion Oil Division

LICENSED "CAT" ASPHALT PRODUCERS

give you fast, efficient service—coast-to-coast!

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Oklahoma City 2, Oklahoma

AMERICAN LIBERTY OIL CO.
P. O. Box 8105
Dallas, Texas

COSDEN PETROLEUM CORP.
P. O. Box 151
Arlington, Texas

HENRY H. CROSS CO., INC.
122 South Michigan Avenue
Chicago 3, Illinois

DOUGLAS OIL CO.
612 South Flower Street
Los Angeles 17, California

THE FLINTKOTE CO., INC.
30 Rockefeller Plaza
New York 20, New York

GULF STATES ASPHALT CO.
Melrose Building
Houston 2, Texas

HUSKY REFINING CO.
P. O. Box 380
Cody, Wyoming

PHILLIPS PETROLEUM CO.
Bartlesville, Oklahoma

SHELL OIL CO.
50 West 50th Street
New York 20, New York

STANDARD OIL CO. of OHIO
Midland Building
Cleveland 15, Ohio

TRUMBULL ASPHALT CO.
59th & Archer Road
Summit (Argo P.O.), Illinois

WITCO CHEMICAL CO.
122 East 42nd Street
New York 17, New York

IN CANADA:

BRITISH-AMERICAN OIL CO., LTD.
B-A Building
800 Bay Street
Toronto, Ontario, Canada

EXCELSIOR REFINERIES, LTD.
222 Tegler Building
Edmonton, Alberta, Canada

HUSKY OIL & REFINING, LTD.
815 6th Street West
Calgary, Alberta, Canada

LION

*Trade-mark of Monsanto Chemical Co.

(Continued from page 140)

from 26th Ave. N. to Lowry Ave., MINNEAPOLIS, MINN. CD 4/22.

Standard Stone Co., 342 Snelling Ave., South St. Paul, Minn. LB **$84,929.** (4 bidders), furnish materials and constr. sidewalk, Distr. 1, ST. PAUL, MINN., City, O. P. Simon, Jr., city purch. agt., 253 City Hall, St. Paul, Minn. CD 4/24.

Ashbach Constr. Co., 1910 West County Road C, St. Paul, Minn. LB **$588,000.** (6 bidders), grade and pave Shepard Road from Wilkin St. to James Ave., ST. PAUL, MINN., O. P. Simon, Jr., city purch. agt., 253 City Hall, St. Paul, Minn. CD 4/24.

IOWA—State Hy. Comn., John G. Butter, ch. engr., Ames. Bids opened 4/30.

Iowa—**Brogan Constr. Co.**, 321 Locust St., Des Moines. LB **$93,987.** bridges and culverts, FN-939, Buena Vista and Cherokee Counties;

Iowa—**Goderson-Smith Constr. Co.**, Ida Grove, Iowa. LB **$88,234.** bridges and culverts, FN-958, Carroll Co.;

Iowa—**J. C. Costigan**, Elkader, Iowa. LB **$129,736.** bridges and culverts, F-305 (8), Dubuque Co.;

Iowa—**The Gould Constr. Co.**, P. O. Box 626, Davenport. LB **$152,492.** UG-831 (6), Scott Co.;

Iowa—**Hanson Constr. Co.**, Washington, Iowa. LB **$435,407.** S-541 (3) Wapello Co. CD 4/17.

▲ IOWA—State Hy. Comn., John G. Butter, ch. engr., Ames. Bids opened 4/30.

Iowa—**Hallett Constr. Co.**, Crosby, Minn., LB **$167,415.** c. conc. 0.317 mi., S 506 (5, Iowa Co.; LB **$431,615.** b. conc. 11.442 mi. Special F-772 (7), Jasper Co.;

Iowa—**Central Constr. Co.**, 108 E. Boston, Indianola, Iowa. LB **$125,286.** c. conc., 0.697 mi. FN-70, Mahaska Co.;

Iowa—**E. M. Duesenberg, Inc.**, P.O. Box 1188, Mason City, Iowa. LB **$478,786.** c. conc. 10.798 mi., F-886 (9), Plymouth and Woodbury Counties; Lb **$320,877.** c. conc. 7.542 mi. F-210 (1), Plymouth Co.;

Iowa—**Jackson Constr. Co., Inc.**, Nevada, Iowa. LB **$255,-831.** pavement wid'n. and resurf. 1.002 mi. U-206 (15) Polk Co.;

Iowa—**Highway Surfacers, Inc.**, New Hampton, Iowa. LB **$100,802.** b. conc. 4.002 mi. S 828 (1), Boone Co.;

Iowa—**W. Hodgman & Sons, Inc.**, Fairmont, Minn. LB **$93,987.** b conc. 7.303 mi. S-216 (3), Floyd Co.; LB **$576,500.** b. conc. wid'n. and resurf. 10.232 mi. FN 43 (2), O'Brien Co.; LB **$98,650.** b. conc. 0.658 mi. FN-43 (3), O'Brien Co.;

Iowa—**Green Constr. Co.**, 321 Locust St., Des Moines, Iowa. LB **$152,719.** grading, 15.139 mi. Special FN-939, Buena Vista and Cherokee Counties;

Iowa—**Wilburg Nielsen Co.**, 1531 N. Saddle Creek Rd., Omaha, Neb. LB **$153,147.** grading 7.677 mi. F-305 (8) Dubuque Co. CD 4/17.

† **Eugene Luhr & Co.**, Columbia, Ill., LB **$433,731** (8 bidders) repairing dikes and revetment, Missouri River, Upper Civil-Peru Bends, near Hamburg, Inv. 25-066-57-98, IOWA, U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 2. CD 4/19.

Western Eng. Co., Harlan, Iowa, CA **$81,555.** b. conc. surf. ALGONA, IOWA. Kossuth Co., Court House, Algona, Iowa. Bids Apr. 17.

American Cast Iron Pipe Co., 916 Walnut St. Bldg., Kansas City, Mo., CA **$96,906** water mains, CEDAR FALLS, IOWA. City, Cedar Falls, Iowa. Bids Apr. 15.

† **Langer & Assoc.**, 225 Jewett Bldg., Des Moines, Iowa, LB **$94,780** (5 bidders) flight simulator training bldg., Municipal Airport, Inv. 25-066-57-89, DES MOINES, IOWA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Apr. 26. CD 4/11.

Kaser Constr. Co., 3111 Ingersoll St., Des Moines, Iowa, CA **$140,073.** (4 bidders) stone and bit. surf., RED OAK, IOWA. Montgomery Co., Red Oak, Iowa. Bids Apr. 16.

▲ **MISSOURI**—State Hy. Comn., Jefferson City, Bids opened 4/26

Mo.—**Rock Hill Asphalt & Constr. Co.**, 8820 Ladue Rd., St. Louis, Mo., LB **$79,015** (five bidders), bit. mat. 1.037 mi. Boone Co.;

Mo.—**M. J. Davidson**, 5828 Lindenwood Ave., St. Louis, Mo., LB **$106,577** (4 bidders), granular surf. 8.837 mi. Iron Co.;

Mo.—**J. A. Tobin Const. Co.**, 3701 Rainbow Blvd., Kansas City, Mo., LB **$373,520** (7 bidders), two-24 ft. c. conc. pavement 0.521 mi. Clay Co.; LB **$663,986,** (7 bidders), two-24 ft. c. conc. pavement 0.958 mi. Clay Co.; LB **$465,398,** (7 bidders) two-24 ft. c. conc. pavement 1.041 mi. Platte Co. CD 4/10.

MISSOURI—State Hy. Comn., Jefferson City, Bids opened 4/26,

Mo.—**J. A. Tobin Const. Co.**, 3701 Rainbow Blvd., Kansas City, Mo., LB **$124,231** (7 bidders), two 80 ft., one 65 ft. and one 50 ft. I-beam spans, Clay Co.; LB **$143,357** (7 bidders) two 70 ft., two 56 ft., two 35 ft. and one 47 ft. I-beam spans, Platte Co.; LB **$159,075** (7 bidders) one 72 ft., two 60 ft. I-beam spans, Platte Co.; LB **$81,484** (7 bidders), two 45 ft., one 25 ft. concrete girder spans, Platte Co.; LB **$112,366** (7 bidders) two 75 ft., two 50 ft. and one 41 ft. I-beam spans, Clay Co.; LB **$129,142** (7 bidders), two 68 ft., one 56 ft. and one 46 ft. I-beam spans, Clay Co.; LB **$79,464** (7 bidders), two 52 ft., two 37 ft. I-beam spans, Clay Co.;

Mo.—**J. W. Githens**, 5012 10th St., Poplar Bluff, Mo., LB **$82,014** (4 bidders) one 120 ft. steel truss, two 65 ft., and one 49 ft. I-beam spans, Oregon Co. CD 4/10.

D. J. Edwards Constr. Co., Excelsior Springs, Mo., LB **$55,162** water supply imprv., incl. dam and treatment plant and steel pipe, DEARBORN, MO. City, Dearborn, Mo. Bids Mar. 11. CD 2/23/56.

Boyd Bros., Stillwell, Kan., LB **$49,674.** water transmission lines (Dearborn, Mo.)

ARKANSAS—State Hy. Dpt., State Capitol, Little Rock. Bids opened 5/19.

Ark.—**Jeffrey Contractors, Inc.**, 4201 Towson St., Fort Smith, Ark., LB **$338,287,** grading 2.9 mi. for 4-lanes to connect new Hot Springs Hy. with Hy. 88, near Hot Springs, Garland Co.;

Ark.—**Northwest Ark. Asphalt Co.**, Sulphur Springs, Ark. LB **$89,351,** surf. 17.5 mi. Brashers-Ozark Rd., Hy. 23, Franklin and Madison Counties;

Ark.—**Linwood Smith Co.**, Lake Village, Ark., LB **$240,381,** grading, surf. 10.7 mi. Rosston-Camden Rd., Hy. 4, Nevada Co.;

Ark.—**Schmeckenbecher Bros.**, Sweet Home, Ark., LB **$130,528,** grading, surf. 9 mi. Kirby-Amity Rd., Hy. 84, Pike Co. CD 4/23.

▲† **Southwest Welding & Mfg. Co.**, 3201 W. Mission Rd., Alhambra, Calif., CA **$7,555,445,** supplying, installing 4 surge tanks and 2 penstocks for Power Units No. 4 and 5, Garrison Power Dam Plant, near Riverdale, NORTH DAKOTA. U. S. Eng., Riverdale, N. D. Bids Mar. 5, awarded May 1. CD 3/18, under LB.

▲† **Leslie Miller, Inc.**, 5524 E. Lancaster St., Fort Worth, Tex., CA **$1,083,734,** hydrant fueling sys., Grand Forks Air Force Base, Inv. 25066-57-53, GRAND FORKS, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Apr. 11. CD 4/17.

Commonwealth Electric Co., 1901 Y St., Lincoln, Neb., LB **$46,700.** Neligh Line Terminal, Gavins Point Reservoir Project, Inv. 25-066-57-91, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Apr. 30. CD 4/11.

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Iowa, LB **$5,044,552;** approach fill at Chicago, St. Paul & Pacific R.R. bridge, Inv. 24-066-57-92, near Mobridge, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 2. CD 4/10.

Knox Constr. Co., Tekamah, Neb., CA **$434,656** (3 bidders) 165.8 mi. rural dist. lines in Merrick and Hall Counties, NEBRASKA. Southern Nebraska Rural Public Power Dist., Grand Island, Neb. Bids Apr. 25. CD 4/10;

C. & P. Electric Co., Great Bend, Kan., CA **$134,726** (5 bidders) 11.9 mi. lines and two sub-stations in Merrick, Hall and Hamilton Counties (Nebraska).

Roberts Constr. Co., 1018 Trust Bldg., Lincoln, Neb., CA **$79,481.** curbs, gutters and graveling, BEATRICE, NEB. City, City Hall, Beatrice, Neb. Bids Apr. 23. CD 4/17.

Korshoj Constr. Co., Blair, Neb., CA **$75,240.** water sys. impres., BELLEVUE, NEB. City, Bellevue, Neb. Kirkham, Michael & Assocs., Standard Oil Bldg., Omaha, Neb., engrs.

Chase Brass & Copper Co., Inc., 236 Grand St., Waterbury, Conn., CA **$102,166.** condenser tubes for North Omaha Power Station, Unit No. 3, OMAHA, NEB. Omaha Public Power Dist. 17 and Harney Sts., Omaha, Neb. CD 2/6/56, under Public Buildings.

Otto Willich, Horton, Kan., CA **$87,100,** sewage treatment plant, auxiliaries, appurtenances, ONAGA, KAN., City, City Hall, Onaga, Kan. Bids Apr. 17.

Chicago Bridge & Iron Works, 3222 S. Michigan Ave., Chicago, Ill., CA **$108,960** (2 bidders) 500,000 gal. elevated water tank, PARSONS, KAN. City, City Hall, Parsons, Kan. Bids Apr. 23, awarded Apr. 25. CD 4/11.

Purtzer & Dutton, Norton, Kan., CA **$95,498** sewage treatment addns. with auxiliaries, and appurtenances, VALLEY CENTER, KAN. City, Valley Center, Kan. Bids Mar. 19.

† **Bureau Indian Affairs, Dpt. Interior**, P. O. Box 1777, Albuquerque, N. M., cancelled bids to have been opened Apr. 4, electrical wiring imprvs., Claremore Indian Hospital Bldg., Proj. ABU-PH 24F, CLAREMORE, OKLA. CD 3/22.

Metropolitan Paving Co., 300 S. Indiana St., Oklahoma City, Okla., CA **$138,393,** asph. paving, District 1319, OKLAHOMA CITY, OKLA. City, City Hall, Oklahoma City, Okla. CD 7/27/55.

F & M Constr. Co., 2104 N. McArthur St., Oklahoma City 11, Okla., LB **$270,744,** est. $284,267, sanitary main sewer to serve Baptist Hospital, OKLAHOMA CITY, OKLA. City, City Hall, Oklahoma City, Okla. Bids Apr. 30. CD 4/23.

TEXAS—State Hy. Comn., Austin, Bids opened Apr. 16,

Anchor-Wate Co., P. O. Box 856, Almeda, Tex., LB **$84,452,** Middle Bernard Creek and Eagle Branch Creek Bridges and approaches 0.397 mi. Hy. St. 60, Proj. S. 1042 (5), Wharton Co.

TEXAS—State Hy. Comn., Austin, Bids opened Apr. 17,

Allen Keller Co., P. O. Box 393, Fredericksburg, Tex., LB **$161,484.** widen bridge, b. conc. paving and surface treating 8.561 mi. Hy. US 87, Proj. 71-6-23, Gillespie Co.

C. F. Lytle, 250 Ins. Exchange Bldg., Sioux City, Iowa, CA **$375,000,** 3,000,000 cu. yd. earth moving in industrial area, ARLINGTON, TEX. Great Southwest Corp., c/o Angus Wynne Jr., pres., 401 Wynnewood Village, Dallas, Tex. CD 5/3.

Mid-West Contractors, Inc., Rte. 7, Box 495-G, Dallas, Tex., CA **$79,110.** GSC industrial storm sewer lines and open drainage, Sec. 1, near ARLINGTON, TEX. Great South West Corp., c/o Angus Wynne, Jr., 401 Wynnewood Village, Dallas, Tex. Powell & Powell, 501 Thomas Bldg., Dallas, Tex., engrs. CD 5/3.

Mid-West Contractors, Inc., Rte. No. 7, Box 495-G, Dallas, Tex., CA **$75,000.** Natural gas lines, Sec. 1 GSC industrial, near ARLINGTON, TEX. Great Southwest Corp., c/o Angus Wynne, Jr., 401 Wynnewood Village, Dallas, Tex. Powell & Powell, 501 Thomas Bldg., Dallas, Tex., engrs. CD 5/3.

Layne-Texas Co., 9620 John West Rd., Dallas, Tex., CA **$50,000,** water supply well, Proj. 587A, CLARKS-

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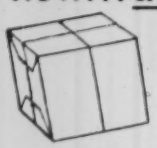

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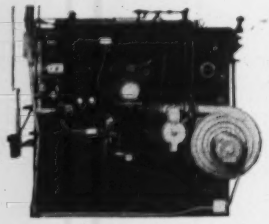

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VILLE, TEX. City, City Hall, Clarksville, Tex. Bids Apr. 8. CD 4/9.

Goldston Co., Box 672, Corpus Christi, Tex., LB $159,873, cargo dock, CORPUS CHRISTI, TEX. Nueces Co. Navigation Dist. No. 1, Guggenheim-Cohn Bldg., Corpus Christi, Tex. Bids Apr. 12. CD 8/31.

City, City Hall, Dallas, Tex., Force Account. $132,650, asphalt paving portions and imprvs. streets, DALLAS, TEX. Rob. F. Acnoy, 2331 Gus Thomasson, Dallas, Tex., engr. CD 1/31/56.

† **Burk Constr. Co.**, Box 261, San Angelo, Tex., LB $164,422, FOOD COMMISSARY, Laughlin Air Force Base, ENG-41-243-57-33, DEL RIO, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids Apr. 17. CD 3/18.

Steed Constr. Co., P. O. Box 964, Fort Worth, Tex., LB $292,561, est. $310,000. Clearfork raw water connection, Cont. 11, FORT WORTH, TEX. City, c/o Thomas A. McCann, mayor, Fort Worth, Tex. Freese & Nichols, 407 Danciger Bldg., Fort Worth, Tex., engrs. Bids May 2. CD 4/8.

Brown & Root, Inc., Box 3, Houston, Tex., LB $113,485. asph. paving Hardy St., Lorraine to Quitman and Elysian, Lorraine to Hardy, HOUSTON, TEX. City, City Hall, Houston, Tex. Bids Apr. 28. CD 10/24.

Gaylord Constr. Co., 806 Blodgett St., Houston, Tex., LB $198,961 est. $250,000. 1st sect. widening Westheimer Rd. west of Buffalo Speedway to Post Oak Road, HOUSTON, TEX. City, City Hall, Houston, Tex. Bids Apr. 30. CD 4/19.

† **McKenzie Constr. Co.**, Box 806, San Antonio, Tex., CA $759,876. Sch. 1, air freight terminal, ENG-41-243-57-37, KELLY AIR FORCE BASE, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids Apr. 25, CD 5/2, under LB.

† **U. S. Govt.**, c/o Directorate Procurement & Production SAAMA Bldg. 43, Kelly Air Force Base, San Antonio, rejected bids Mar. 1, addn and modification to existing Cell No. 45 and Control Room in Bldg. No. 656, Inv. 41-608-57-225, KELLY AIR FORCE BASE, TEX. LB $303,749. CD 3/15, under LB.

City, City Hall, Port Arthur, Tex., rejected bids to have opened Apr. 16, water line, Job 41J, and Seawall Road, Job 41K, Contr. No. 1, PORT ARTHUR, TEX. Est. $75,000. CD 4/10.

Cage Bros., 6959 San Pedro Ave., San Antonio, Tex., LB $847,399. constr. sewage treatment plant, SAN ANTONIO, TEX. City, City Hall, San Antonio, Tex. Bids Apr. 25, CD 4/12.

City, City Hall, San Antonio, Tex. Owner Builds. $75,000. Another storm sewer line; $150,000. storm drainage line, off downtown from Commerce and Losoyo to Bonham and Blum to Elm Sts. SAN ANTONIO, TEX. CD 9/19/52.

† **Baldwin-Lima-Hamilton Corp.**, Pelton Div., 2929 19 St., San Francisco, Calif., LB $76,626 (2 bidders). two governors for regulating speed of hydraulic turbines for Fremont Canyon Power Plant, Spec. DS 4862, WYOMING. Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo. Bids Apr. 23. CD 2/21.

WYOMING—State Hy. Comn., Cheyenne,
Wyo.—**Riedesel-Lowe Co.**, 501 E. 15 St., Cheyenne, Wyo., CA $274,644, est. $65,788, 2 WF girder span interchange separation structures, grading, approaches, Hynds Blvd Proj. I-223 (18) Unit II Laramie Co.; CA $73,586, est. $92,696. hy. separation structure over Casper urban F St. road. I-225 (6) Sec. 1, Natrona Co.;
Wyo.—**Ellingford Bros., Inc.**, Evanston, Wyo., CA $119,127, est. $130,262, 3 interchange structures on Evanston-Ft. Bridger Rd., Proj. I-091-1 (1) Unita Co. Grand total $467,377. Bids Apr. 25, awarded Apr. 26. CD 4/11.

▲ WYOMING—State Hy. Comn., Cheyenne,
Wyo.—**Wilbur Christensen Constr.**, Ringsted, Iowa. CA $476,606, est. $567,607, base, sand grav. seal, 5 struc. plate pipe and misc. work 7.498 mi. F-040-2 (1), Niobrara Co.;
Wyo.—**Huntley Constr. Co.**, Rock Springs, Wyo., CA $516,779, est. $470,873, base, sand grav. 4 struct. plate pipe and misc. work 8.372 mi. S-2100 (1) and State ARS 1089 Comb., Unita Co.;
Wyo.—**Big Horn Constr. Co.**, Sheridan, Wyo., CA $690,850. est. $694,128. select material surf., plant mix base, plant mix and stone chips, 7.998 mi. I-IN-093-4 (2) Natrona Co. Grand total $1,684,235. Bids Apr. 24, awarded Apr. 26. CD 4/11.

† **American Elin Corp.**, 11 Broadway, New York, N. Y. CA $117,000. mfg. single generator unit in Colorado-Big Thompson Power Plant in Colorado-Big Thompson Proj., COLORADO, Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo. CD 3/25, under LB.

▲ **B & L Contractors**, Pueblo, Colo., LB $1,631,612, 115-kv transmission lines, Nucla, COLORADO. Colorado-Ute Electric Assn., Inc., Montrose, Colo. Bids Apr. 30. CD 4/16.

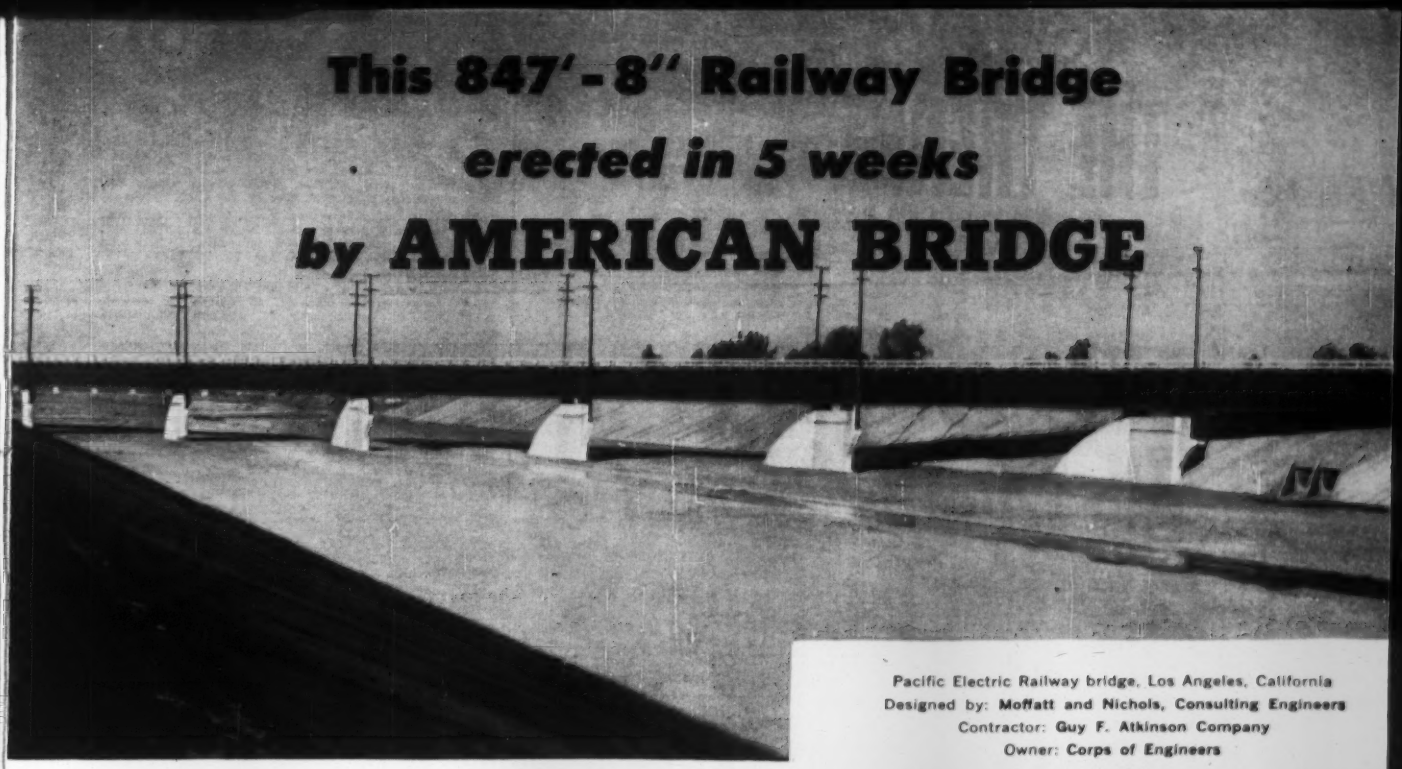
† **R. K. McCullough Constr. Co.**, 676 "G" St., Salt Lake City, Utah, CA $309,000. new visitors center in Quarry area of Dinosaur National Monument, COLORADO-UTAH. National Park Service, Dpt. Interior, 19 and C Sts. N.W., Wash., D. C. CD 4/10/56.

† **H. B. Zachry Co. Constr. Div.**, Box 10188, San Antonio, Tex., LB $383,854, est. $250,000. apron loading P/AC, Holloman Air Force Base, Inv. No. ENG-29-005-57-84, ALAMOGORDO, N. M. U. S. Eng., P.O. Box 1538, Albuquerque, N. M. Bids Apr. 23. CD 3/20.

BUILDINGS—LB & CA

Scheid Plumbing & Heating Co., Austin, Minn., CA $542,452, plumbing, heating and ventilating work,
(Continued on page 146)

This 847′-8″ Railway Bridge *erected in 5 weeks* by AMERICAN BRIDGE



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Contractor: Guy F. Atkinson Company
Owner: Corps of Engineers

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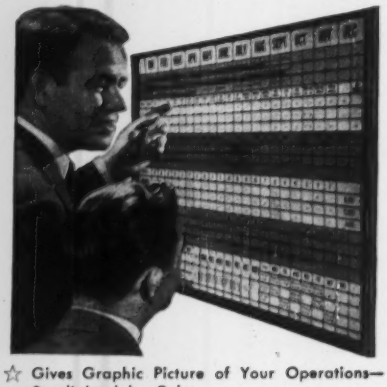

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(Continued from page 144)

Ellis JUNIOR HIGH SCHOOL, AUSTIN, MINN. CD 5/3, under LB.

E. M. Ganley Co., Inc., 2900 Oakland Ave., Minneapolis, Minn., CA **$424,730**, 3 story, ground floor, 43x150 ft. HOSPITAL addn., new wing, MINNEAPOLIS, MINN., Glenwood Hills Hospital, 3901 Golden Valley Rd., Minneapolis, Minn. Bids Apr. 22. CD 4/11.

M. Mandel, 1014 Plymouth Ave., Minneapolis, Minn., CA **$504,474**, general contract WOMEN'S DORMITORY, ST. PAUL, MINN., Hamline University, 1536 Hewitt Ave., St. Paul, Minn. Bids Apr. 16. CD 4/23.

Bungartz-Weiss, Inc., 6015 Gravois Ave., St. Louis 16, Mo. Owner Builds. **$500,000.** 56 RESIDENCES in Rockwood Hills Subdivision, off Lavinia Dr. between Musick Rd. and Highway 21, AFFTON (ST. LOUIS 23 P.O.), MO.

Fairview Baptist Church, Joplin, Mo., Separate Contracts. **$700,000.** EDUCATIONAL BLDG. and SANCTUARY, JOPLIN, MO.

▲ **B. & F. Constr. Co.**, 3616 Sebastian Lane, St. Louis Co. 15, Mo. Owner Builds. **$2,000,000.** 300 RESIDENCES in Larimore Hills Subdivision on Larimore Rd. a mi. north of Highway 66 in St. Louis Co., ST. LOUIS COUNTY, MO.

McDaniel Bros Constr. Co., Jonesboro, Ark., CA Est. **$500,000.** concrete slab, tilt-up concrete walls, INDUSTRIAL PLANT to house a metal products mfg. lessee, near Jonesboro Airport and Hy. U. S. No. 63, JONESBORO, ARK. Jonesboro Chamber of Commerce and City, c/o Mayor Herbert Sanderson, City Hall, Jonesboro, Ark. CD 4/25.

Hogenson Constr. Co., Flour Exchange Bldg., Minneapolis, Minn., CA **$95,000.** GRAIN ELEVATOR addn., MADDOCK, N. D. Maddock Farmers Grain Co., Maddock, N. D.

Stoneberg Constr., Lead, S. D. CA **$570,890.** HIGH SCHOOL AND AUDITORIUM, STURGIS, S. D. Independent School Dist. 12, Meade Co., Sturgis, S. D. Lucas, Graig & Whitman, 618½ St Joe St., Rapid City, S. D., archts. Bids Mar. 20. CD 4/3, under LB.

Rorick Constr. Co., 2512 Deep Park Blvd., Omaha, Neb., LB **$846,262**, general contract APARTMENT, 22 and Cass Sts., OMAHA, NEB. Omaha Educational Assn., 927 City Natl. Bank Bldg., Omaha, Neb. Bids Apr. 16. CD 4/2.

J. M. Odom, Box 774, Austin, Tex., CA **$519,923.** ALLAN JUNIOR HIGH SCHOOL, Phase B, AUSTIN, TEX. Austin Independent School Dist., 701 E. 11 St., Austin, Tex. Bids Apr. 19, CD 5/1, under LB.

J. W. Birmingham, 1809 Morgan St., Corpus Christi, Tex., CA **$103,000.** WORK CENTER, CORPUS CHRISTI, TEX. Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, Tex. Bids Apr. 23, CD 4/9.

▲ **J. W. Bateson Constr. Co., Inc.**, Box 13307, Walnut Hill Station, Dallas, Tex. LB **$1,465,000.** general contract 20 story, 50x200 ft., steel, brick, masonry OFFICE BLDG., DALLAS, TEX. Jacor, Inc., c/o Hedrick, Stanley & Morey, archts-engrs., Box 5055, Dallas, Tex. Bids Apr. 26. CD 4/24.

Lacy R. Keele & Son, 2911 S. Lancaster St., Dallas, Tex. Owner Builds. **$371,000.** 22 DWELLINGS, $357,500. 14 DWELLINGS, DALLAS, TEX. CD 5/3.

Jos. E. Morgan & Sons, Box 721, Dallas, Tex., CA **$184,900**, Base Bid. 2 story, 20,000 sq. ft. solid brick wall PACKING COOLER addn., DALLAS, TEX. Neuhoff Bros., Packers, 2821 Alamo St., Dallas, Tex. Bids Apr. 11. CD 4/3.

▲ **Robert E. McKee, General Contractor, Inc.**, Box 562, El Paso, Tex. LB **$1,353,600.** remodel Section B COUNTY BLDG., EL PASO, TEX. El Paso Co., Courthouse, El Paso, Tex. Bids Apr. 30. CD 4/2.

▲ **Carpenter Bros.**, 1335 Plowman St., Dallas, Tex. LB **$1,000,008.** 2 story OFFICE BLDG., GARLAND, TEX. Temco Aircraft Corp., c/o Jupiter Rd., Garland, Tex. CD 5/3.

▲ **Peachey Constr. Co.**, 1220 Witte St., Houston, Tex., CA **$825,000.** 42 DWELLINGS. CA **$645,000.** 28 DWELLINGS, in 3rd section of Spring Branch Woods, HOUSTON, TEX. Peachey Constr. Co. & Peachy Realty Co., 1220 Witte St., Houston, Tex. CD 3/26.

▲ **J. M. Odom**, Box 744, Austin, Tex. CA **$1,029,725.** SENIOR HIGH SCHOOL, JACKSONVILLE, TEX. Jacksonville Independent School Dist., Jacksonville, Tex. Bids Apr. 25. CD 5/3, under LB.

▲ **W. E. Crawford Constr. Co.**, Box 591, McAllen, Tex. LB **$2,360,640.** constr. 200 DWELLINGS, Proj Tx-11-2, incl. site imprvs. LAREDO, TEX. Laredo Housing Authority, c/o Ed. S. Russell, 2000 San Francisco Ave., Laredo, Tex. CD 4/11.

Eitze-Kitchens Constr. Co., P.O. Box 3316, Austin, Tex., LB **$983,000.** (combined bid) constr. HOSPITAL AND ADMINISTRATION BLDG., MEXIA, TEX. Texas State Hospitals & Special Schools, 4405 Lamar Blvd., c/o W. C. Moore, supt., Austin, Tex. Wilson, Patterson & Assocs., 601 Bailey St., Fort Worth, Tex., and Thomas, Jameson & Merrill, 820 N. Harwood St., Dallas, Tex., archts. Bids May 3, CD 4/16.

Texas Portland Cement Co., Orange, Tex. Owner Builds. **$115,000.** cement MFG. PLANT imprvs., ORANGE, TEX.

W. L. James & Son, 3830 16th St., Port Arthur, Tex., CA **$399,934.** 2 ELEMENTARY SCHOOL UNITS. (No. 1 and No. 2) ORANGE, TEX. Orange Independent School Dist., Orange, Tex. CD 6/14.

Hill & Combs, 321 Melrose St., San Antonio, Tex., CA **$750,000**, constr. 2nd phase SHOPPING CENTER, Austin Hy. opposite the Westerner, SAN ANTONIO, TEX. L. R. Pletz & Assocs., c/o South Texas Bldg., San Antonio, Tex. CD 5/1.

Robert Ross, Builder, 1360 W. Poplar St., San Antonio, Tex., CA **$350,000**, 35 DWELLINGS, SAN ANTONIO,

(Continued on page 150)

new Littleford model 25T Trail-O-Dryer . . . and the famous Littleford Trail-O-Patcher combine to produce a new, complete

SMALL PORTABLE ASPHALT PLANT

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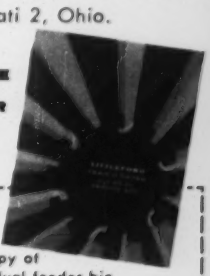

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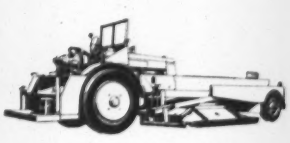

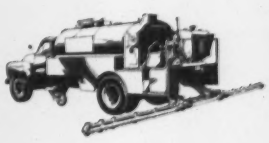

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The "mainline" belt system consists of 2 individual conveyors, each approximately 4,000 ft. long pulley to pulley, laid out to meet the irregular terrain. Successive loads from a continuous line of 35-ton dump trucks are required to keep the system feeding at its peak capacity.

Shown here is one of two 72" conveyor belts that carry rock and earth to the lakeside after it has been deposited in a surge pile by the mainline conveyor. These feeders transfer gravel to two recovery conveyors which can fill a 3,200-ton barge in only 15 minutes!

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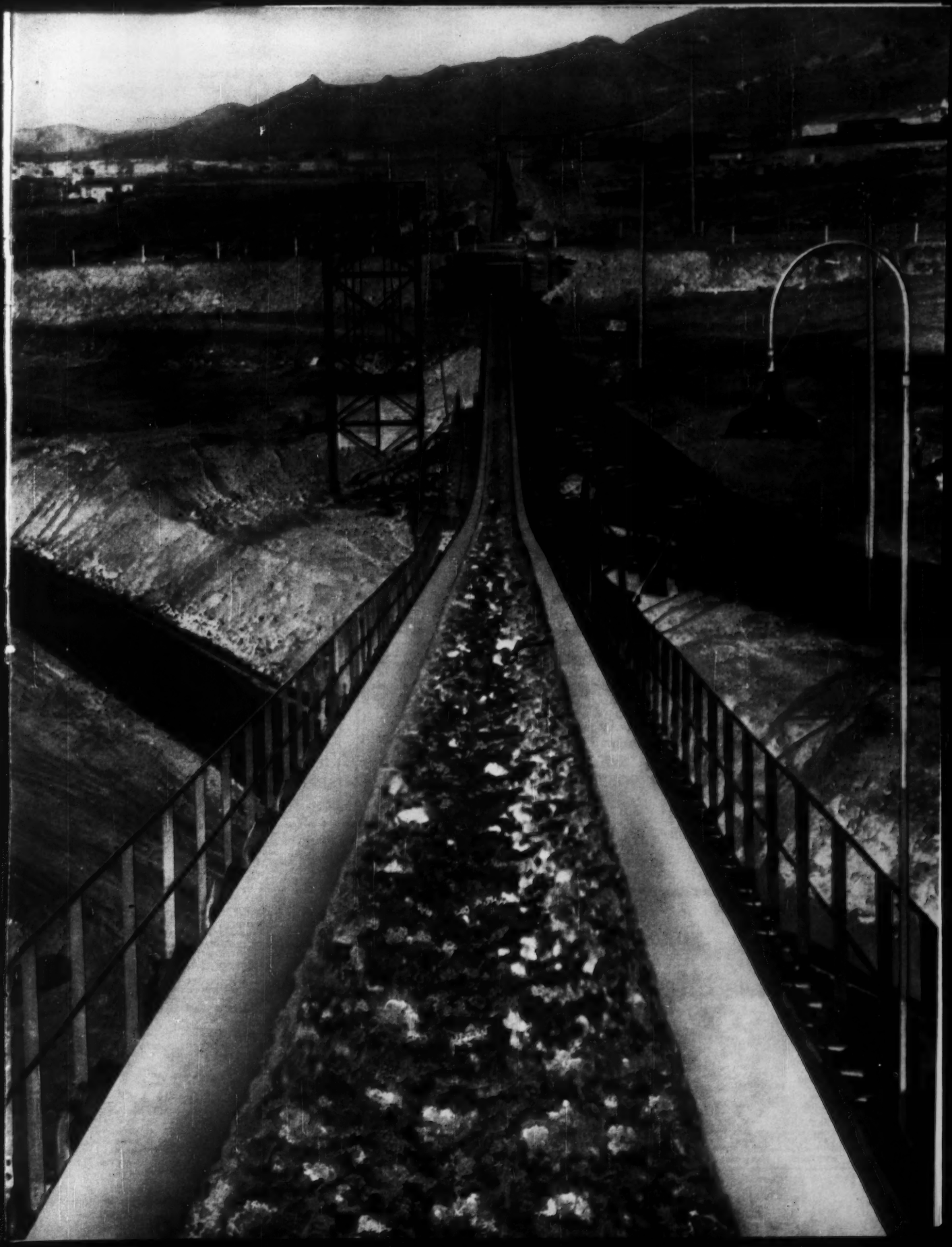

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(Continued from page 146)

TEX. Robert Ross, 1360 W. Poplar St., San Antonio, Tex. CD 4/5.

▲ **J. C. Worcester,** Box 8308, Laurel Heights Station, San Antonio, Tex. **LB $1,168,935.** MEDICAL AND TREATMENT HOSPITAL, SAN ANTONIO, TEX. Bd. for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., Austin, Tex. Bids May 1. CD 4/17.

▲ **Thomas Bate & Sons, Inc.,** 2111 10 St., Denver, Colo., LB **$1,497,000.** DORMITORY and DINING AREA, DENVER, COLO. University of Denver Campus, Denver, Colo. Bids Apr. 30. CD 4/25.

F. A. Heckendorf Constr. Co., Littleton, Colo. CA Est. $500,000. 1 story 115x190 ft. STORE GREELEY, COLO. Safeway Stores, Inc., 612 Railway Exchange Bldg., Denver 2, Colo. Bids Apr. 8. CD 3/28.

FAR WEST

HEAVY CONSTRUCTION—BA

† **Wash., Seattle**—BULKHEADS—BA 5/23—P. Wks. Office, 13th Naval Dist., Naval Station, Seattle, replacing bulkheads at Pier 90, Naval Supply Depot, Specs. 6592/56. $199,000. CD 4/18/56.

† **Washington**—CLEARING RIGHT OF WAY—BA 5/24—Bonneville Power Admin., 1001 N.E. Lloyd Blvd., Portland, Ore., clearing right of way, erecting steel towers and removing steel towers on Raymond-Raymond Tide Flats line relocation ½ mi., Pacific Co., Inv. 8394. Plans deposit $25. L. C. Stewart, c/o owner, engr. CD 2/5/51.

† **Washington**—BA 5/28—Bureau Reclamation, Dpt. Interior, Ephrata, deep drains DE 49 and tributaries, Block 43, Columbia Basin Proj., Spec. 117C-437. L. N. McClellan, Bldg. 1A, Denver Federal Center, Denver, Colo. ch. engr. CD 9/10.

† **Oregon**—BA 6/4—U. S. Eng., Pittock Block, Portland, Ore., strip and excavate abutments for Cougar Dam and clearing portion of reservoir area at Cougar Reservoir South Fork McKenzie River, Lane Co., CIVENG-35-026-57-234. Jackson Graham, c/o owner, engr. CD 7/16.

† **Washington**—BA 6/4—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver 2, Colo., furnishing one 15- by 29.65 ft. penstock coaster gate with extra replacement parts for Grand Coulee Dam, Columbia Basin Proj., Spec. DS-4911; adv. ENR 5/16. CD 9/26/51.

† **Wash., Spokane**—GRADING, etc.—BA 6/7—U. S. Eng., 4735 E. Marginal Way, Seattle 4, grading, draining, b. conc. paving, access road to Deep Creek Air Force Station, near here, ENG-45-108-57-139. CD 12/27/54.

† **California**—BA 6/11—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Ventura, Item 1; one 4-ft. by 4 ft. high pressure gate valve, with conduit lining transitions, one 143,000 lb. hydraulic hoist, one semiautomatic gate hanger and one and ⅛ in. standard shoulder eyebolt for outlet works at Casitas Dam, DS 4904.

† **Idaho, Boise**—ROCKET STORAGE—BA 6/11—U. S. Eng., City-County Airport, Walla Walla, Wash., 1 story, 3,100 sq. ft., rein.-con. rocket storage bldg. with utilities, at Gowen Field, ENG-45-164-57-46. CD 2/6/56.

Washington — BA 6/14 — Chelan County Public Utility Dist., 327 N. Wenatchee Ave., Wenatchee, general contract for final-stage construction of Rocky Reach Dam; electrical contract for final-stage constr. of Rocky Reach Dam, Wenatchee, Stone & Webster Eng. Corp., Lloyd Bldg., Seattle, Zone 1, engrs. CD 2/2/55.

† **Guam, Marianas Islands**—MESS—BA 6/17—Bureau Yards & Docks, Dpt. Navy, Resident Officer in Charge of Constr., 383 Fell St., San Francisco, Calif., officers' mess, Naval Air Station. $700,000. Plans deposit $50. CD 4/10, under LB.

† **Oregon**—BA 6/18—Bureau Reclamation, Dpt. Interior, Bldg. 234, Camp White, Ore., 9 mi. north of Medford, Green Springs powerplant, switchyard and penstock, Rouge River Basin Proj., 11 mi. southeast of Ashland, Spec. DC-4905; adv. ENR 5/16. CD 9/4.

† **Oregon**—BA 6/19—Bureau Reclamation, Dpt. Interior, Camp White, fish screen structure for Savage Rapids Dam, Grants Pass Proj. near Grants Pass, Spec. DC-4910; adv. ENR 5/16. CD 9/9/44.

BUILDINGS—BA

† **Oregon** — GARAGE — BA 5/28 — Proj. Constr. Eng., Bureau Reclamation, Dpt. Interior, Camp White, Ore., garage, Talent Div., Rogue River Basin Proj., Spec. 100C-295. CD 9/4, under Earthwork, Waterways.

HEAVY CONSTRUCTION—SLC

Calif., Oakland—MAUSOLEUM—Home of Eternity Mausoleum, c/o Hertzka & Knowles, archts., 85 Post St., San Francisco, soon lets contract, 1 story marble facing and chapel, mausoleum addn. $220,000. CD 5/1.

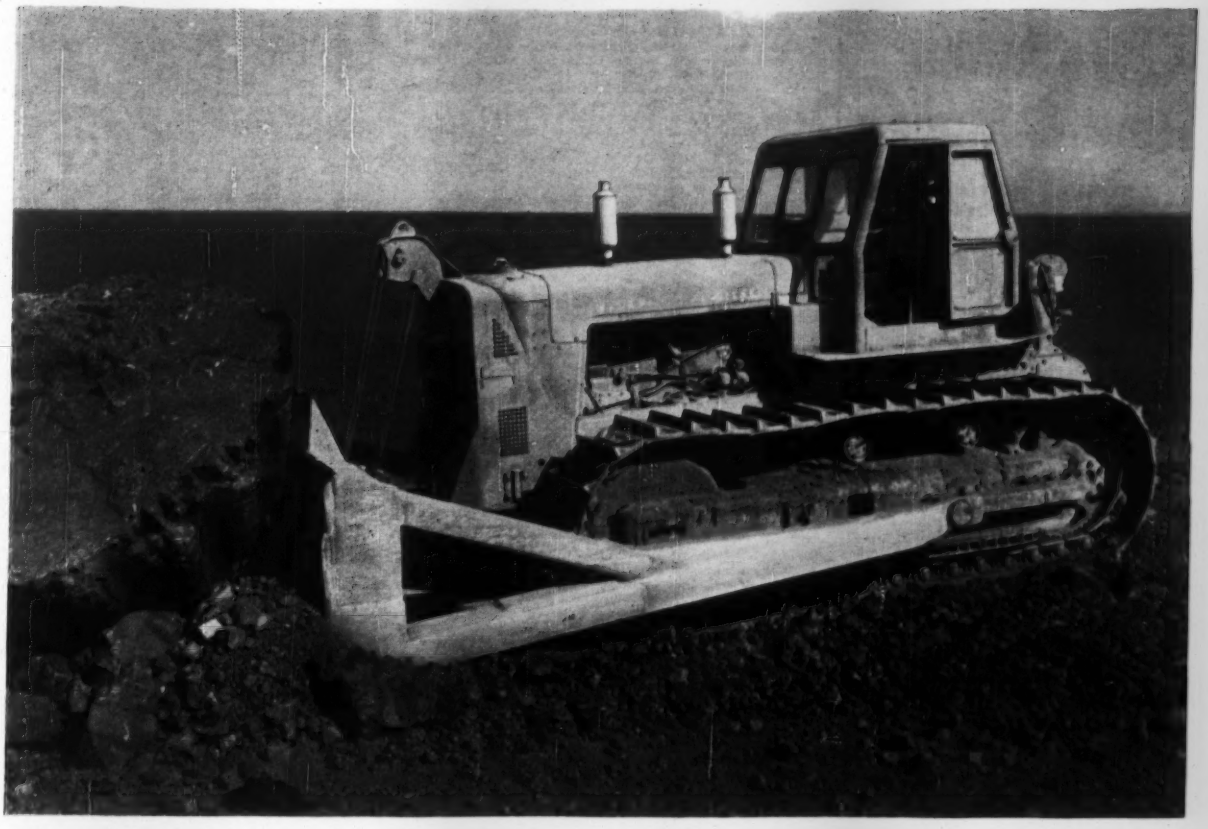
BUILDINGS—SLC

Wash., Pullman—SERVICE—Washington Water Power Co. W 825 Trent St., Spokane, soon lets contract, 1 story 95x100 ft. masonry service bldg. $190,000. H. C. Bertelsen, Empire State Bldg., Spokane, archt. CD 2/5, under Washington, Unclassified.

HEAVY CONSTRUCTION—LB & CA

▲† **Morrison-Knudsen Co. Inc.,** 319 Broadway, Boise, Idaho, CA **$1,961,980,** relocating Northern Pacific Ry. facilities, Section IV, Eagle Gorge Dam Proj., Kanasket, Inv. 57-39, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 17. CD 4/24, under LB.

(Continued on page 152)



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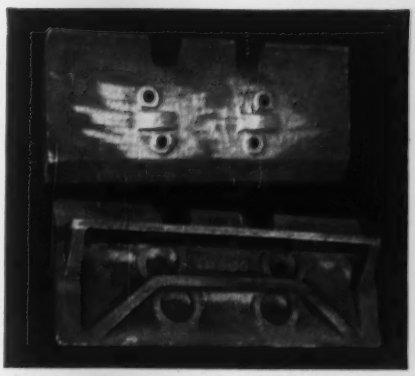

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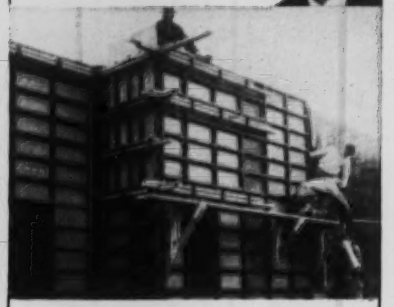

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(Continued from page 150)

▲ **WASHINGTON**—State Hy. Comn., Olympia, Wash.—**C. E. Oneal, Inc.**, Ellensburg, Wash., CA **$646,796**, clearing, draining, grading 4.261 mi. Primary State Hy. No. 2, FAP I-002-2 (10) Kittitas Co.;

Wash.—**Harrison Bros. Co.**, 220 Wakefield Dr., Tacoma, Wash., CA **$712,107**, clearing, draining, grading, rein.-con. bridge abutments and moving steel bridge 4.164 mi. Primary State Hy. 2, Keechelus dam to Midway, Kittitas Co.; CD 5/1, under LB;

Wash.—**M. J. Kuney Co.**, N. 120 Ralph St., Spokane, Wash., CA **$1,060,153** (4 bidders) clearing, draining, grading 2.169 mi. Primary State Hy. 2, FAP I-002-2 (8) Kittitas Co. Bids Apr. 23. Grand total $2,419,056. CD 4/26, under LB.

▲ **G. F. Atkinson Co.**, 10 W. Orange Ave., South San Francisco, Calif., LB **$7,259,122**, est. $7,604,400 (5 bidders) 3½ mi. power canal, 60x144 ft., rein.-con. structural steel powerhouse and associated structures for Swift Hydro Project No. 2 on Lewis River, Skamania and Cowlitz Counties, WASHINGTON. Washington Utility Dist. No. 1, Cowlitz Co., 1421 14 Ave., Longview, Wash. Bids May 3. CD 4/8.

F. Taylor, 2317 Minor Ave. N., Seattle, Wash., LB **$143,818**, 14,300 ft. 12 and 16 in. c.i. water supply main, MUKILTEO, WASH. Mukilteo Water Dist., 5 and Park Ave., Mukilteo, Wash. Bids Apr. 30; **Hammond Iron Works**, Provo, Utah, LB **$80,295**. 2 m.g. steel reservoir (Mukilteo, Wash.).

† **Thompson & Georgeson, Inc.**, 1924 S.E. 6 Ave., Portland, Ore., CA **$148,925**. AC&W Operations Bldg. addn., Inv. 57-112., NASELLE, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 18. CD 4/3.

▲ **Manson Constr. & Eng. Co.**, 5209 E. Marginal Way, Seattle, Wash. LB **$1,019,358**. bulkhead and pier for Shilshole Bay Moorage Proj., SEATTLE, WASH. Port of Seattle, Bell St. Terminal, Seattle 1, Wash. Bids Apr. 30.

Ward Constr. Co., 4055 21 Ave. W., Seattle, Wash., LB **$128,153**, repairs to mainline track and various turnouts and lead track to terminal, Inv. 57-95B, SEATTLE, WASH. Procurement Div., Seattle Army Terminal, 1519 S. Alaskan Way, Seattle, Wash. Bids Apr. 26. CD 4/3.

† **Ausland Constr. Co.**, P.O. Box 437, Grants Pass., Ore., LB **$113,462**, main canal structures, Station 123 plus 00 to Station 829 plus 00 Medford and Rogue River Valley Irrigation Dist., Spec. DC 4728, OREGON. Bureau Reclamation Dpt. Interior, Bldg., 234, Camp White, Ore. Bids Apr. 16. CD 3/21.

† **C. M. Corkum Co.**, 2630 S.W. 2 Ave., Portland, Ore., CA **$541,418**, Cascade Salmon Hatchery, on Eagle Creek, OREGON. Fish & Wildlife Service, 1001 N.E. Lloyd Blvd., Portland, Ore. Bids Apr. 15, awarded Apr. 29. CD 4/23, under LB.

▲† **General Constr. Co.**, 4850 N.W. Front St., Portland, Ore., LB **$1,395,645**, est. $1,215,252 (3 bidders) repairing outer end of north jetty, pile dikes at Coos Bay, CIVENG-35-026-56-208, OREGON, U. S. Eng., Pittock Block, Portland, Ore. Bids Apr. 30. CD 4/10.

† **Harbert Bros.**, Route 1, Estacada, Ore., LB **$102,607**, (10 bidders) stone revetment and drift embankment, right bank of South Santiam River, Gunderson location, Linn Co., CIVENG-35-026-57-205, OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids May 2. CD 4/10.

† **U. S. Eng.**, 4735 E. Marginal Way, Seattle 4, Wash. cancelled bids to have been opened May 10, recreation bldg., operations bldg. addn. and tower foundation for Air Force Station, ENG-45-108-57-128, BURNS, ORE. CD 4/24.

† **D. W. Thompson**, North Bend, Ore., CA **$77,398**, est. $81,668 (3 bidders) 38x54 ft. rein.-con. operations bldg. addn. on rein.-con. fdns. Air Force Station, ENG-45-108-57-115, NORTH BEND, ORE. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 17. CD 3/15.

▲ **Union Pacific R.R. Co.**, J. A. Bunjer, ch. engr., 1416 Dodge St., Omaha 2, Neb. Own Forces. $5,000,000. 239,000 ft. new trackage at Albina yards; repair shed storage bldg., yardmaster office, PORTLAND, ORE.

† **Harold's Constr. Co.**, 3738 Mt. Diablo Blvd., LaFayette, Calif., LB **$351,310** (1 bidder) repairs to North and South Jetties, (replace stone on slope and repair breached mid sections) ENG-57-64, Humboldt Bay, CALIFORNIA. U. S. Eng., 180 New Montgomery St., San Francisco, Calif.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N St., Sacramento,

J. E. Haddock, Ltd., 3538 East Foothill Blvd., Pasadena, Calif. CA **$3,742,457**. grading, surf. 5 mi. U. S. 101 between Conejo Grade Summit and 5th St., in Camarillo and constr. 4 bridges, Ventura Co. Bids Apr. 11, awarded Apr. 30, CD 4/15, under LB.

▲ **CALIFORNIA**—State Div. Hy., 120 S. Spring St., Los Angeles, Bids opened 5/2,

Kenneth H. Golden, M. H. Golden, F. C. Young, Young & Arrieta, 3485 Noell St., San Diego, Calif. LB **$3,594,047** (3 bidders). grading, surfacing 2.9 mi. 8 lane divided freeway between 0.4 mi. west of Sign Rte. 198, in La Mesa and Ballantyne Lane in El Cajon, (Xi-SD-12-LMSA, B, ECJ) San Diego Co. CD 4/8.

▲ **CALIFORNIA**—Calif. Div. Hys., 1120 N St., Sacramento, Bids opened 5/1.

Calif.—**A. Teichert & Son, Inc.**, 1931 Stockton Blvd., Sacramento, Calif., LB **$842,773**, grading, surf. 5.4 mi. Sign Rte. 32 and constr. two bridges between Chico and 0.6 mi. north of Hog Springs, Butte Co.;

Calif.—**Mercer, Fraser Co., Inc. & Mercer, Fraser Gas Co., Inc.**, 2nd and Commercial St., Eureka, Calif., LB $129,851, surf. 18.4 mi. various locations on US 101 and Sign Rte. 36 between east of Alton and north of Idlewild, Humboldt and Del Norte Counties;

Calif.—**Arthur B. Siri, Inc.**, 1357 Cleveland Ave., Santa Rosa, Calif., LB **$720,587**, seal coating 6.3 mi. Sign Rte. 53 between Cache Creek and Sign Rte. 20 and constr. draining facilities, Lake Co.;

Calif.—**Basich Bros. Constr. Co. & N. L. Basich**, 1148 North San Gabriel Blvd., South San Gabriel, Calif. LB **$255,301**, paving 21.3 mi. Rte. 40 between Rte. 23 and Nevada State Line, Mono Co. CD 4/8.

† **Raymond Constr. Co.**, P.O. Box 186, Fresno, Calif., LB **$84,700**, (4 bidders) flight simulator bldg. at Fresno Air Terminal, Inv. 57-31, FRESNO, CALIF. National Guard, U. S. Fiscal & Prop. Officer, P. O. Box 1139, Sacramento, Calif.

Sheets Constr. Co., 201 E. Victoria St., Gardena, Calif., LB **$139,214** (7 bidders), est. $154,580: imprv. Manse Ave., Rosecrans Ave. to Compton Blvd. and Kingsdale Ave. to Hawthorne Blvd., Lawndale, CI 1653, LOS ANGELES, CALIF. Los Angeles Co. Bd. Supervs., 501 Hall of Records, Los Angeles, Calif. Bids Apr. 26. CD 4/8.

McGuire & Hester, 796-66th Ave., Oakland 22, Calif., CA **$848,902**, water supply lines from Hillsborough Bridge, Burlingame, SAN FRANCISCO, CALIF. City & San Francisco Co. Pub. Utility Comn., City Hall, San Francisco, Calif. Awarded Mar. 19. CD 3/13, under LB.

† **E. H. Morrill Co.**, 999 Anthony Rd., Berkeley, Calif., LB **$104,866** (3 bidders) imprv. Boiler Feedwater Equipment Bldg., Bldg. No. 123, Mare Island Naval Shipyard, NBy 7010, VALLEJO, CALIF. Dist. P. Wks. Office, Room C112, 12th Naval Dist., San Bruno, Calif. Bids Apr. 24. CD 4/11.

▲ **Pacific Bridge Co.**, 256 Montgomery St., San Francisco, Calif., LB **$1,421,735** (7 bidders) 2,069 ft. bridge and 2,100 ft. approaches, between Marysville and Yuba City, YUBA CITY, CALIF. Yuba and Sutter Counties, c/o Yuba Co. Rd. Comr., Courthouse, Yuba City, Calif. CD 2/18.

BUILDINGS—LB & CA

† **Bureau Reclamation, Dpt. Interior**, Vernal, Utah, rejected bids Apr. 9, WAREHOUSE BLDG., for Flaming Gorge Govt. Community, Colorado River Storage Proj., near Linwood, Utah, Spec. DC 4870, UTAH, LB **$223,295**. CD 4/18, under LB.

▲ **John F. Long Constr. Co.**, 4747 W. Indian School Rd., Phoenix, Ariz. Owner Builds. **$1,000,000**. 56 HOMES, 3,640 sq. ft. under roof, 120 ft. pumice block to be known as "Maryvale Estates", PHOENIX, ARIZ.

† **Anchor Constr. Co.**, P.O. Box 444, Roswell, N. M., LB **$426,458** (6 bidders) SCHOOL FACILITIES, BU 603-348, SEBA DALHAI, ARIZ. Bureau Indian Affairs, Box 1777, Albuquerque, N. M. Bids Apr. 25. CD 3/29.

† **Thompson Constr. Co.**, Kennewick, Wash., LB **$171,613**, signal maintenance shop and utilities, facilities and paving, ENG-45-164-57-34, CAMP HANFORD, WASH. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Apr. 23. CD 3/15.

A Peters, Longview, Wash., CA Est. **$350,000**. 100x154 ft. BOWLING ALLEY BLDG., Ocean Beach Hy. and Washington Way, LONGVIEW, WASH. Twin City Development Corp., Longview, Wash. R. Newhall, Longview, Wash., archt.

R. L. Absher, Puyallup, Wash, CA Est. **$300,000**. 1 story, 80x300 ft., rein.-con. line HEADQUARTERS, PUYALLUP, WASH Puget Sound & Light Co., White-Henry-Stuart Bldg., Seattle 1, Wash. D. Allison & Assocs., Auburn, archts.

▲ **H. George & Sons**, Hutton Bldg., Spokane, Wash., CA foundations for two 100-ton ELECTRIC FURNACES, SEATTLE, WASH. Bethlehem Pacific Coast Steel Corp., 28 Ave. S.W. and W. Andover St., Seattle, Wash CD 1/4.

Riley Pleas Co., 522 19 Ave. N., Seattle, Wash., LB **$367,345**, 1 story, 108x120 ft., rein.-con. Cleveland HIGH SCHOOL addn., SEATTLE, WASH. School Dist. No. 1, 815 4 Ave. N., Seattle, Wash. J. W. Maloney, Central Bldg., Seattle 4, Wash., archt. CD 3/15/54.

Pacific Coast Builders, 1 South Park, San Francisco, Calif LB **$885,599**, (6 bidders) 3 story, rein.-con. WING AT ALAMEDA HIGH SCHOOL, Central Ave. between Walnut and Oak Sts., ALAMEDA, CALIF. Alameda Unified School Dist., c/o Supt., 1315 Oak St., Alameda, Calif. Warnecke & Warnecke, Financial Center Bldg., Oakland, Calif., archts. Bids Apr. 30. CD 4/12.

▲† **Main Cornice Works, Inc.**, 2824 N. Main St., Los Angeles, Calif., CA **$1,355,435**. modify temporary mobilization type barracks, AVI-57-44, FORT ORD, CALIF. Office of Purchasing & Contg., Fort Ord, Calif.

Western Empire Constr. Co., Concord, Calif., LB **$416,500**, 1 story, 28,000 sq. ft., wood frame constr. Tyrell Ave. SCHOOL HAYWARD, CALIF. La Vista Elementary School Dist., c/o Supt., 27845 Western Rd., Hayward, Calif. Anderson & Simonds, 2800 Park Blvd., Oakland, Calif., archts. CD 9/5.

† **P. J. Walker Co.**, 3900 Whiteside St., Los Angeles, Calif. CA **$812,471**. guidance station at Camp Cooke, ENG-04-353-57-82, LOMPOC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Apr. 18. CD 4/24, under LB.

▲ **M. J. Brock & Son**, 2894 Rowena Ave., Los Angeles, Calif., CA **$2,000,000**, 12 story, 53x174 ft. concrete APARTMENT, 100 Atlantic Ave., LONG BEACH, CALIF. Royal Palms Apts., Inc., 6691 Paramount Blvd., Long Beach, Calif.

Diversified Builders, Inc., P.O. Box 390, Montebello, Calif., CA **$153,000**, 41,040 sq. ft. WAREHOUSE, 6510 E. Bandini Blvd., LOS ANGELES, CALIF. Allied Chemical & Dye Corp., 2999 W. 6th St., Los Angeles, Calif. Paul Tolen, 8217 Beverly Blvd., Los Angeles, Calif., engr.

Walter H. Christensen, 18714 Parthenia St., Northridge, Calif., LB **$385,000** (8 bidders) Gledhill St. SCHOOL, San Fernando, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Apr. 25. CD 4/12.

Cahill Constr. Co., 530 Sansome St., San Francisco, Calif., LB **$502,000** (6 bidders) 3 story, 24,000 sq. ft., structural steel and frame OFFICE BLDG., PALO ALTO, CALIF. Owner, c/o Clark & Beuttler, archts., 522 Mission St., San Francisco, Calif.

Wagner & Martinez, 181 S. Park St., San Francisco, Calif., CA **$250,000**, 1,500 sq. ft. SEED PLANT addn., MOUNTAIN VIEW, CALIF. Ferry-Morse Seed Co., Evelyn Ave. and Whisman Rd., Mountain View, Calif.

Gavel & Flanders Constr. Co., 229 W St., Sacramento, Calif., LB **$166,618** (4 bidders) BLDGS. and site development at Aerojet General Corp. Liquid Rocket Plant, NIMBUS, CALIF. Aerojet General Corp., Nimbus, Calif.

▲ **Tri-W-Builders, Inc.**, 4595 El Cajon Blvd., San Diego, Calif. Owner Builds. **$1,217,050**. 99 stucco DWELLINGS, Rho Cabrillo No. 4, SAN DIEGO, CALIF.

Frank Corbett, 320 N. Evergreen, North Sacramento, Calif., CA **$400,000**. GRAIN WAREHOUSE AND DRYER, Riz Rd., WILLOWS, CALIF. Westside Warehouse Co., c/o contractor.

Woodland Mill Supply Co., Davis Hy., Woodland, Calif., CA **$150,000**. GRAIN STORAGE FACILITIES at ASA Grain Handling Co. Plant, incl. 26 storage bins and 1 dryer, WOODLAND, CALIF. Adams, Schwab & Adams, c/o contractor.

CANADA

HEAVY CONSTRUCTION—BA

Northwest Territories, Norman Wells—RUNWAY—BA 5/20—Dpt. Transport, Hunter Bldg., Ottawa, Ont. bit. runway 6,000x200 ft. Norman Wells Airport, Over $100,000.

BUILDINGS—BA

Ont., Kingston—RESIDENCE—BA 5/31—Queen's University, Kingston, 4 story, bsmnt. 50x240 ft., frame, stone men's residence $900,000. Barott, Marshall, Merrett & Barott, 1425 Mountain St., Montreal, Que., archts. Lindley Shector, 5830 Decelles Rd., Montreal, Que., engr. CD 12/20.

Que., Montreal—PLANT—Bids Asked—Borden Co., Ltd., 280 Murray St., dairy plant, Cote de Liesse Rd. $400,000. (**Correction**—estimated cost). CD 5/6.

Que., Montreal—APARTMENT—Bids Asked—St. Mark Tower Corp., 1512 Church Ave., St. Laurent, Montreal, 13 story, bsmnt., 38x102 ft. rein.-con., frame, apartment, Lincoln Ave. between St. Mark and Fort Sts. $500,000. Harry Stillman, 4790 Roslyn Ave., archt.

▲ **Que., Montreal**—DAIRY PLANT—Bids Asked—Borden Co., Ltd., 280 Murray St., dairy plant, Cote de Liesse Rd. $4,000,000.

BUILDINGS—SLC

Ont., Peterborough—PLANT—Coca-Cola Ltd., 90 Broadview Ave., Toronto, soon lets contract 1 story 28,000 sq. ft. bottling plant. $200,000. Mathers & Haldenby, 15 St. Mary St., Toronto, archts.

HEAVY CONSTRUCTION—LB & CA

Commonwealth Constr. Ltd., 300 Royal Bank Bldg., Winnipeg, Man. LB **$474,811**, Runway Exten. No. 13-31, 2,300 ft. conc., asph. recapping of existing Runway 13-31, ramping and drainage, WINNIPEG, MAN. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Apr. 25. CD 4/15.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,

John T. Hepburn Ltd., 914 Dupont St., Toronto, Ont., LB **$294,500** (7 bidders) Contr. 57-26 structural steel for new bridge on Hy. 68 over Spanish River at Espanola.

Towland Constr. Ltd., Box 815, London, Ont. LB **$294-151.** (15 bidders) airport development, incl. strengthening, wid'n. extending Runway 08-26 and car parking area, LONDON, ONT. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Apr. 25. CD 4/17.

Carter Constr. Co. Ltd., 419 Cherry St., Toronto, Ont. CA **$971,745**. grade separation, subway under railway tracks, Bloor St. W., west of Islington, TORONTO, ONT. Municipality of Metropolitan, Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Mar. 18, awarded Apr. 26. CD 4/1, under LB.

Richardson Constr. Co. Ltd., 68 Yonge St., Toronto, Ont., LB **$145,829** (12 bidders) Bayview Ave. bridge over Don River, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Apr. 29. CD 4/3.

▲ **Sir Robert McAlpine & Sons, (Canada) Ltd.**, Box 249, Weston, Ont. CA **$1,058,122**, roadwork at Dundas St. W. and Royal York Rd. interchange grading, drainage, paving, Contract 6-57, TORONTO, ONT. Municipality of Metropolitan, Toronto, Ont. Bids Apr. 1, awarded Apr. 26. CD 4/9, under LB.

Lakeshore Constr. Inc., 187 Cartier Ave., Pointe Claire, Que., LB **$235,557** (8 bidders) sewers and water services at Indian Reservation, CAUGHNAWAWA, QUE. Dpt. Citizenship & Immigration Indian Affairs Branch, Ottawa, Ont. Bids Apr. 22. CD 4/8.

Adelard Boisvert, 6000 Third Ave., Rosemont, Montreal, Que. B **$92,325**. 12 in. c.i. water mains Henri Bourassa Blvd. from Millen to Meilleau Aves., MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Apr. 24. CD 4/17.

Cambrian Constr. Ltd., 6555 Cote Des Neiges Rd., Montreal, Que., LB **$534,800** (7 bidders) standard O.R. Mess at R.C.A.F. Stations, ST. JOHNS, QUE. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Apr. 30. CD 4/11.

BUILDINGS—LB & CA

Foundation Co. of Canada Ltd., 1302 West 11 Ave., Calgary, Alta. CA Est. **$200,000**. WAREHOUSE and REPAIR SHOP, 5½ acre site, CALGARY, ALTA. Construction Equipment Co. Ltd., 6373 Cote de Liesse Rd., Montreal, Que. J. Stevenson & Assoc., 344 12 Ave. W., Calgary, Alta., archts. Awarded Apr. 25.

▲ **Acme Constr. Co. Ltd.**, Rothesay Ave., St. John, N. B. CA **$1,484,781**. (5 bidders) 8 story, 53x176 ft. structural steel, brick wing, HOSPITAL addn., Waterloo St., ST. JOHN, N. B. St. John General Hospital, St. John, N. B. Bids Apr. 23. CD 3/19; **W. S. McKnight Ltd.**, 10 Release Centre, Moncton, N. B. LB **$780,500**. (3 bidders) mechanical contract for hospital addn. (St. John, N. B.)

▲ **Evan S. Martin Constr. Ltd.**, 641 Caledonia Rd., Toronto, Ont., CA Est. **$1,000,000**. 1 story FACTORY, and 1 story OFFICE, Park Rd. and Henry St., BRANTFORD, ONT. Ladish Co. of Canada Ltd., Brantford, Ont. Murton & Barnes, Harbor Administration Bldg., Hamilton, Ont., archts. Awarded Apr. 30.

Newman Bros. Ltd., 4A Clare St., St. Catherines, Que., Ont., CA **$600,000**. APARTMENTS for mine workers at uranium mining property at ELLIOTT LAKE, ONT. Stanrock Uranium Mines Ltd., 80 Richmond St. W., Toronto, Ont. Awarded Apr. 29.

Len Ariss & Co. Ltd., 150 Surrey St. E., Guelph, Ont. CA Est. **$375,000**. 1 story, 300x300 ft. brick, block steel frame FACTORY, Edinburgh Rd., GUELPH, ONT. Hammong Mfg. Co. Ltd., 40 Wellington St. W., Guelph, Ont. Awarded Apr. 26.

Newman Brothers Ltd., 4A Clark St., St. Catherine, Ont. CA **$600,000**. 55 HOUSES at copper mine, 40 mi. north of Lake Superior, MANITOUWADGE, ONT. Awarded Apr. 26.

Smith Brothers Constr. Co. Ltd., 1740 Ellen St., Niagara Falls, Ont. LB **$667,985**. (11 bidders) 2 story, steel, concrete, brick, Rosedale COLLEGIATE, NORTH BAY, ONT. North Bay Collegiate Bd., 382 Fraser St., North Bay, Ont. CD 3/8.

Curran & Herridge Constr. Co. Ltd., 283 Confederation St., Sarnia, Ont., CA **$190,552**. 3 story, 100x100 ft., brick, transite latex handling PLANT, SARNIA, ONT. Polymer Corp. Ltd., S. Vidal St., Sarnia, Ont. Giffels & Vallett of Canada Ltd., 65 Elliott St. E., Windsor, Ont., engrs. Awarded Apr. 30. CD 2/1/56.

Milne & Nicholls Ltd., 57 Bloor St. W., Toronto, Ont. CA **$750,000**. 1 story 214,000 sq. ft. brick, block FACTORY, Birchmount Rd., TORONTO, ONT. W. J.

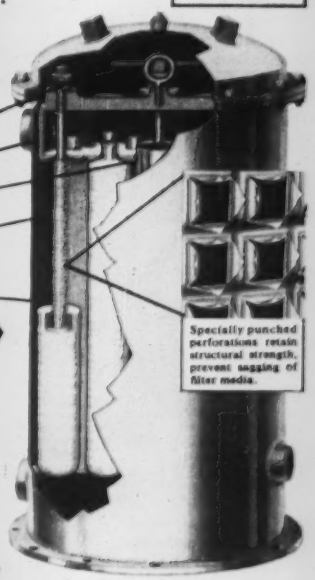
THE PROBLEM: **"Heavy duty filtration to your specification"**

THE ANSWER **"ENGINE LIFE *Maxiflo* '4000' SERIES OF FULLY ENCASED, MULTIPLE FILTER SYSTEMS!"**

Replaceable Element Filtration For Marine, Diesel and Natural Gas Engines In:

HEAVY INDUSTRY (Pipelines & Power Plants)
CONSTRUCTION (Heavy Earth-Moving Equipment)
MARINE ENGINES · STATIONARY ENGINES

"4000" SERIES

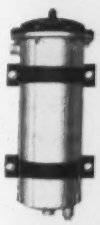


- Elements uniformly compressed with wing-nut bolts. This reduces service cost factor.
- Cast aluminum manifold for ideal element compression.
- Neoprene "O" Ring Seal insures perfect seal, eliminates gasket replacement.
- Piston type bypass valves do not orifice when open, valves face downward so abrasives will not adhere to piston and be flushed back into engine.
- Heavy welded steel construction.

Maxiflo non-corrosive metal cores handle up to ten times normal running volume, give solid vertical support.

MODERN FUEL CONDITIONING THROUGH "4000" FULL FLOW SYSTEMS

- Condition viscous lube oil and fuel.
- Remove, neutralize acid without using chemicals.
- Trap abrasives: carbon, dust, metal particles.
- Meet today's supercharged engine requirements.
- Give maximum oil flow, minimum pressure loss.
- Repel moisture on element surface.



Maxiflo **"3000" SERIES** *Ratio-rated for:*

OIL DRILLING RIG ENGINES · PUMPING ENGINES · TRUCKS · MARINE ENGINES (light) · CONSTRUCTION (Euclid trucks, shovels, etc.)

For moderately heavy duty installations, the Maxiflo "3000" Series offer the same consistent performance as the "4000" Series.

FOR BOTH *Maxiflo* "4000" AND "3000" COMPLETE DIMENSION DRAWINGS AND SPECIFICATIONS FURNISHED ON REQUEST

ENGINE LIFE PRODUCTS CORPORATION
EL MONTE, CALIFORNIA
ENGINEERED FILTRATION SERVICE

A Comprehensive Line of Filters and Replacement Elements

Gage & Co. Ltd., 84 Spadina Ave., Toronto, Ont. Bids Apr. 16, awarded May 1. CD 4/3.

Pigott Constr. Co. Ltd., 1250 Bay St., Toronto, Ont., CA AIRCRAFT PLANT addn. portion "D-1 East" TORONTO, ONT. Avro Aircraft Ltd., Malton Airport, Toronto, Ont. Awarded Apr. 23.

Toronto Industrial Leaseholds Co. Ltd., 12 Sheppard Ave., Toronto, Ont., CA $200,000. 1 story, 163x169 ft., concrete block, brick, block FACTORY and OFFICE, Lawrence Ave. W. near Dufferin St., TORONTO, ONT. Nestle Le Mur Co. of Canada Ltd., 680 King St. W., Toronto, Ont. Awarded Apr. 29.

Milne & Nicholls Ltd., 57 Bloor St. W., Toronto, Ont., CA Est. $350,000. 1 story, 20x140 ft., concrete block BOYS CLUB, swimming pool, LIBRARY, WORK-SHOP, Dovercourt Park, TORONTO, ONT. Dovercourt Club c/o W. H. Rae, Canadian Oil Companies Ltd., 204 Richmond St. W., Toronto, Ont. Bids Apr. 9, awarded Apr. 30. CD 3/27.

Guy Lemaire, 2266 Pie IX Blvd., Montreal, Que., Owner Builds. $390,000. HOUSING DEVELOPMENT, incl. 19 duplexes, 45 Ave. Rosemont suburb, MONTREAL, QUE. Chalifoux & Geoffroy, 6275 Papineau Ave., Montreal, Que., archts.

Roland Kean Ltd., 10250 Millen St., Montreal, Que. Owner Builds, $400,000. HOUSING, Millen St., MONTREAL, QUE.

Louis Dallaire & Fils, Normandin, Que., CA $600,000. SCHOOL and RESIDENCE, NORMANDIN, QUE. La Commission Scolaire de Normandin, Normandin, Que. Bids Apr. 24, awarded May 1. CD 4/9.

Roland Gendron, 1200 125 St., Shawinigan Falls, Que., CA Est. $350,000. SCHOOL and RESIDENCE, Parish St. Charles Garnier to replace school on Hemlock St. SHAWINIGAN FALLS, QUE. Sisters Dominicaines du Rosaire, Hemlock St., Shawinigan Falls, Que. Arthur Lacoursiere, 279 4 St., Shawinigan Falls, Que., archt. Awarded Apr. 26.

Raymond Lecompte Constr. Inc., 34 Avenue des Erables, Valleyfield, Que., CA $350,000. CHURCH SUPER-STRUCTURE Rue de Salaberry, VALLEYFIELD, QUE. LaFabrique de la Paroisse de St. Esprit, Valleyfield, Que. Pierre Dionne, 100 Champlain St., Valleyfield, Que., archt. Bourgeois & Matineau, 3405 Ridgewood Ave., Montreal, Que., engrs. Awarded Apr. 29.

ALASKA

HEAVY CONSTRUCTION—BA

† **Alaska, Naknek**—APARTMENT—BA 5/24—Civil Aeronautics Admin., Box 440, Anchorage, 6 unit 24x268 ft. apartment, 14x24 ft. garage and utilities at King Salmon Airport, Inv. 5-57-102.

HEAVY CONSTRUCTION—LB & CA

† **Connolly Constr. Co.**, Anchorage, Alaska, LB $134,715, est. $158,268 (4 bidders) 7 mi. 7200-volt primary overhead line from Fort Richardson power plant to guided-missile Site Summit, Inv. 57-75, ALASKA, U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 30. CD 4/11.

† **Modern Elec. Co., Inc.**, Anchorage, Alaska. LB $292,780, est. $313,850. antenna constr. at Buskin Lake in Kodiak Naval Station, Reservation, Specs. 2428/57, KODIAK, ALASKA. P. Wks. Office, 17th Naval Dist., Kodiak, Alaska. Bids Apr. 16. CD 3/21.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **McDonough Constr. Co. of Florida**, 8247 S. Dixie Hy., Miami, Fla. LB $1,096,554, Item No. 1; LB $1,066,720, Item No. 2, enlisted men's barracks, U.S.N.A. S. Leeward Point Field, NBy-1477, GUANTANAMO BAY, CUBA. 10th Naval Dist., San Juan, Puerto Rico. Bids Apr. 25.

AMERICANS ABROAD

BUILDINGS—LB & CA

▲ **Lummus Co.**, 385 Madison Ave., New York 17, N. Y. Est. $30,000,000. REFINERY in County Cork, EIRE. California-Texas Oil Co. Ltd., 380 Madison Ave., New York, N. Y., U.S.A. Esso Petroleum Co., 15 W. 51 St., New York, N. Y., U.S.A. and British Petroleum (subsidiary of Standard Oil Co of N. J., 30 Rockefeller Plaza, New York, N. Y.) CD 7/16.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., Hanford**—City, City Hall, bond election June 11, to acquire and imprv. existing private water system, $3,000,000.

Colo., Wheat Ridge—Valley Water Dist., c/o Richard-Chambers-Bunger Eng. Co. (formerly Utility Eng. Co.), 9655 W. Colfax St., Lakewood, voted bonds Apr. 23, water line and wells, incl. development of wells and reservoirs, 16 mi. various diam. c.i. pipe, distr. sys. $450,000. CD 4/11.

▲ **Ga., Atlanta**—Atlanta Water Works City Hal, Atlanta, voted bonds, pumping and water purification system at Chattahoochee River Station. $4,650,000. CD /21/52; re-regulation dam at Morgan Falls, $500,000; Egan plant, $1,700,000.

▲ **Mont., Billings**—Yellowstone Co., Court House, water sys. on Billings Bench, near here. $1,635,500, Morrison & Maierle, Helena, consult. engrs. CD 10/11/54.

Que., St. Francois De Sales—Municipality, filtration plant. $600,000.

▲ **Sask., Moose Jaw and Regina**—Cities of Moose Jaw and Regina, City Halls, Moose Jaw and Regina, water treatment plant addn. $1,000,000. H. R. Powell & Partners, Smith Tower, Seattle 4, Wash., U. S. A., consult. engrs. CD 6/10/55.

SEWERS, WASTE DISPOSAL

▲ **Ga., Atlanta**—Fulton Co., Court House, and City, City Hall, Atlanta, voted $11,000,000 bonds, Long Island Creek Sewerage System, $977,000; Marsh Creek Sewerage System, $918,800; Camp Creek Sewerage System, $700,000; various trunk and outfall sewers extens, $831,200; sewer extens. throughout city, $1,500,000; replacing of old sewers, $1,000,000; storm water channel paving, covering and extending interceptor sewers, $500,000. CD 4/3.

Ill., LaSalle—City, City Hall, sewage treatment plant, Michigan Canal basin, between Buckling and Gooding Sts. $750,000. Warren & Van Praag, Inc., 253 S. Park St., Decatur, consult. engr.

▲ **N. J., New Market**—Piscataway Sewer Auth., Municipal Bldg., sewers in Durham Park and Lake Nelson-Piscataway Twp., $1,400,000.

▲ **O., Akron**—Comrs. Summit Co. Court House, Phase 1, 4,000 ft. force mains lining Euclid Div. Plant to Hudson sewer mains. $150,000; Phase 2, disposal plant, $1,400,000; Phase 3, exten. trunk sewer south of Euclid Plant, $450,000. Sauter, Ritchie & Doan, 1238 Highbridge St., Cuyahoga Falls, consult. Engrs. Leslie Wolfe, co. engr.

▲ **Wash., Hoquiam**—City, City Hall, intercepting sewers, lagoon sewage treatment facility, outfall sewers and storm sewers, $1,500,000. Work this summer. CD 3/21.

▲ **Wash., Seattle**—Lake City Sewer Dist., 3206 E. 125 St., sewerage sys. in area bounded by E. 170 and 125 Sts., 1, 8 and 15 Ave. N.E., Roosevelt Way and Aurora Ave. $2,350,000. Bids in June. CD 3/1/56.

▲ **Ont., Port Arthur**—Ontario Water Resources Comm., East Block, Parliament Bldgs., Toronto, sanitary treatment plant, $600,000; trunk sewers, about $1,400,000. R. V. Anderson & Assocs., Ltd., 194 Wilson Ave., Toronto, consult. engrs.

BRIDGES

▲ **Ga., Atlanta**—City, City Hall, voted bonds Techwood Drive Viaduct, $3,800,000. CD 4/3, under Streets and Roads.

▲ **Ga., Atlanta**—Fulton Co., Court House, voted bonds, Apr. 17, Hunter Street Viaduct $3,000,000; 3 railroad underpasses between Glenn St. and south limits of College Park, $3,000,000; Chattahoochee River Bridge, $300,000. CD 4/3 under Streets and Roads.

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But something's gotta give!
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ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,
Creditville—railway overpass between 6 and 8 acres of farm land. **$250,000.**

STREETS AND ROADS

CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford,
Fairfield—storm water drains, Post Road from Round Hill Road to Turney Creek; King's Hy. cutoff; from Conn. Turnpike to Traffic Circle; drain under Round Hill Road Railroad Viaduct. **$500,000.** Bids in 1957.

▲ **Ga., Atlanta**—City, City Hall, and Fulton Co., Court House, voted bonds Apr. 17,
connector between Peachtree St. and expressway **$2,000,000;**
widening Piedmont Road, **$3,320,000;**
expressway perimeter route and primary road connectors **$2 500,000;**
widening Hunter Street, **$1,210,000;**
widening Roswell Road, **$1,550,000;**
exten. Lakewood Ave. **$2,635,000;**
widening Moreland Ave. **$400,000;**
widening North Ave. **$800,000;**
connector between access road and Gordon Road **$1,400,000.** CD 4/3.

NEW YORK—Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany,
Steuben Co.—constr. from point on Rte. 70 approx. 2 mi. east of village of North Hornell for approx. 2 mi. in an easterly direction, then easterly following a gap of about 8¼ mi. on Rte. 70 for approx. 3½ mi. to jct. of Rtes. 15 and 70, FAI Proj. **$900,000.**

▲ **OHIO**—State Hy. Dpt., Columbus,
Jefferson Co.—relocation of State Rte. 7, 2.86 mi. through center of city of Toronto, **$4,000,000.** Goodkin & O'Dea 610 Bloomfield Ave., Bloomfield, N. J., consult. engrs. S. S. Price, Dist. 11, State Hy. Dpt., New Philadelphia, design engr.

EARTHWORK, WATERWAYS

▲ **Connecticut**—Electric Power, Inc., P. O. Box 2010 Hartford Zone 1, hydro-electric dam and generating plant in Connecticut River, small set of locks will be provided to let boats through, Enfield, East Windsor and Windsor Locks, **$27,000,000.** Charles T. Main Inc., 80 Federal St., Boston, Mass., consult. engr. CD 4/9/56.

▲ **Conn., Hartford**—Park River Flood Control Comn., 11 Asylum St., diverting streams feeding into North Branch of Park River to flow directly to Connecticut River by-passing Hartford, Bloomfield and Windsor, **$1,500,000.** Austin-Nichols & Co., 150 Causeway St., Boston, Mass. addnl. consult. engrs., diverting several streams flowing into south branch of Park River to flow directly to Connecticut River, Newington and Wethersfield, **$950,000.** Goodkind & O'Dea, 30 Church St., New York, N. Y., addnl. consult. engrs. Metcalf & Eddy, 1330 Statler Bldg., Boston, Mass. consult. engrs. on both projects. CD 3/5/56.

AIRPORTS

▲ **Ga., Atlanta**—AIRPORT IMPRVS.—City Council, City Hall, voted **$9,000,000** bonds Apr. 17, municipal airport imprvs. CD 4/3.

Ga., Atlanta—AIRPORT IMPRVS.—Bd. Comrs. Fulton Co. County Court House, voted bonds, county airport imprvs. **$500,000.**

▲† **Miss., Meridian**—HOUSING—P. Wks. Officer, **Naval Base,** plans by Lacy & Stahnke, Roebuck Bldg., and Mary & McNair, Rosenbaum Bldg., Capehart Housing. **$6,300,000.** Hamilton, Schulz & Luke, Roebuck Bldg., mech. engrs. Granberry H. Ward, Roebuck Bldg., electr. engr. Roy Howell, Meridian, structural engr. Eugene Damon, Cochran Bldg., civil engr. CD 11/29.

▲† **N. Y., Plattsburgh**—REHABILITATION PROGRAM—U. S. Eng., 111 E. 16 St., New York 3, plans by Kelly & Gruzen, 80 Fifth Ave., New York, rehab. program, Phase III, Plattsburgh Air Force Base, **$1,000,000-$3,000,000.** CD 2/29/56.

▲† **N. Y., Rome**—LABORATORY—U. S. Eng., 111 E. 16 St., New York, Zone 3, electronic laboratory instrument bldg., **$100,000-$500,000;** SAC ordnance facilities, **$500,000-$1,000,000,** Alexander D. Crosett & Assoc., 27 William St., New York, Zone 7, consult. engrs.; plans by Greenberg & Ames, 303 Fourth Ave., New York 10, N. Y. radio beacon, **$100,000,** all at Griffiss Air Force Base. CD 12/31.

Tex., El Paso—ADMINISTRATION BLDG.—City, City Hall, plans by Garland & Hilles, c/o Banner Bldg., remodeling airport administration bldg. **$540,000.** CD 1/10/56.

Alaska, Dillingham—AIRPORT—City, City Hall, airport constr. **$500,000.**

PUBLIC BUILDINGS

▲ **Ala., Birmingham**—OFFICE—City, City Hall, City office bldg. enlargement, occupied by U. S. Social Security Offices, **$1,000,000.**

▲ **Ala., Decatur**—HOUSING—Decatur Housing Authority, City Hall, 124 white, 76 negro low-rent housing units, **$2,500,000.**

▲ **Calif., Covina**—HOSPITAL—Intercommunity Hospital, 275 W. College St., plans by Jay Dewey Harmish & Eugene Weldon Fickes, 222 E. "B" St., Ontario, 2 story, bsmnt., 60,000 sq. ft. rein.-con. Intercommunity Hospital Addn. (2 addns.) **$1,000,000.**

▲ **Calif., Los Angeles**—SCHOOL—Bd. Educ., 1425 S. San Pedro St., Los Angeles, plans by Charles O. Matcham, Stewart S. Granger & Assoc., 1258 W. 1st St., Los Angeles, rein.-con., stucco Cleveland High School, Northridge. **$3,794,000.** CD 4/8/55.

Calif., Pomona—HOSPITAL—Bd. Directors Pomona Valley Community Hospital, Pomona, plans by Jay Dewey Harnish & Eugene Weldon Fickes, Jr., 222 E. "B" St., Ontario, 4 story, bsmnt., 34,564 sq. ft. rein.-con. Pomona Valley Community Hospital addn. **$500,000.**

Calif., San Bernardino—CHEMISTRY—San Bernardino Valley Union High School Dist. plans by Jones Lockett & Poper and Assoc., Jerome G. Armstrong, 264 Highland Ave., San Bernardino, 2 story, 35,000 sq. ft. poured concrete, brick masonry, chemistry bldg., at San Bernardino Valley Junior College. **$700,000.** CD 3/28/50.

▲ **Calif., Sunnyvale**—HOSPITAL—El Camino Hospital Dist., Bd. Directors, 673 Carolina St., bond election June 11, hospital, **$7,260,000.** Stone, Mulloy, Marraccini & Patterson, 619 California St., San Francisco, archts. CD 3/8.

Calif., Woodland—SCHOOL—Woodland Unified School Dist., c/o Supt., voted bonds Apr. 12, intermediate School. **$575,000.** Mitchell Van Bourg & Assocs., Hotel Claremont, Berkeley, Calif., archts. CD 3/11.

Conn., Cornwall—SCHOOL—Town, Town Hall, plans by Englehardt, Englehardt, Leggett & Cornell, archts.-consult. engrs., 221 W. 57 St., New York, N. Y., Junior High School. **$400,000.**

▲ **Conn., New Milford**—SCHOOL—Town of New Milford, Town Hall, high school. **$1,000,000.**

Conn., Storrs—SCHOOL—State P. Wks. Dpt., 165 Capitol Ave., Hartford, E. O. Smith School addn., University of Connecticut. **$600,000.**

† **D. C., Wash.**—LABORATORY, etc.—General Services Admin., 18 and F Sts. N.W., plans by Ronald Senseman, 7705 Georgia Ave. N.W., laboratory and clinical facilities St. Elizabeth Hospital. **$518,000.** Bids about June 30.

Ga., Atlanta—FIRE DEPARTMENT—Atlanta Fire Dpt. City Hall, voted bonds fire department bldg. **$500,000.**

▲ **Ga., Atlanta**—POLICE DEPARTMENT—Atlanta Police Dpt., 175 Decatur St. S.E., voted bonds police department bldg. **$1,250,000.** CD 2/12.

▲ **Ga., Atlanta**—SCHOOLS—Atlanta School Dpt., 68 Mitchell St. S.W., voted **$16,930,000** bonds Apr. 17, schools. CD 4/3.

Ga., Atlanta—CITY HALL—City Council, City Hall, voted bonds, city hall modernization and renovation, **$700,000.** CD 2/2.

▲ **Ga., Atlanta**—CIVIL CRIMINAL COURT—Bd. Comrs. Fulton Co., Fulton Co. Court House, voted bonds, civil criminal court bldg. **$1,750,000.** CD 2/12.

▲ **Ga., Atlanta**—COURT HOUSE—Bd. Comrs. Fulton Co. County Court House, voted bonds, renovating county court house. **$1,683,000.** CD 2/12.

▲ **Ga., Atlanta**—JUVENILE COURT—Bd. Comrs. Fulton Co., Fulton Co. Court House, voted bonds juvenile court bldg. **$1,850,000.** CD 2/12.

▲ **Ga., Atlanta**—HEALTH CENTER—Fulton Co. Health Dpt., 224 Central Ave. S.W., Atlanta, voted bonds, health center. **$1,250,000.** CD 7/27/55.

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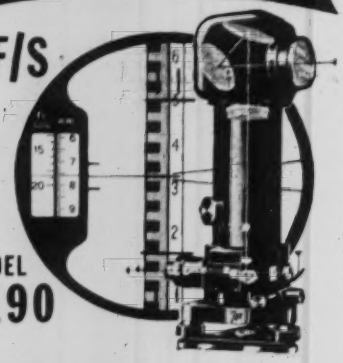

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▲ **Ga., Atlanta**—JAIL—Fulton Co. Police Dpt., 208 Butler St. S.W., voted bonds, jail. $2,000,000. CD 2/12.

▲ **Ga., Atlanta**—HOME FOR AGED—Fulton Co. Welfare Dpt., 165 Central Ave. S. W., voted bonds, Home for Aged, $1,000,000.

▲ **Idaho, Wallace**—AUDITORIUM—School Dist. 393, Wallace, plans by G. M. Rasque & Son, Washington Trust Bldg., Spokane, Wash., 2 story, 97x207 ft. rein.-con. memorial auditorium addn. $1,000,000. Bids in August.

Ind., Huntington—HOSPITAL ADDN.—Comrs. Huntington Co. Court House, plans by A. M. Strauss, Inc., Strauss Bldg., Fort Wayne, 3 story hospital addns., and new 24,700 sq. ft. South wing. $850,000.

Kan., Coffeyville—CLASSROOM—Bd. Educ. plans by Williamson & Loebsack, 2015 Gage St., Topeka, classroom addn. for Coffeyville College, $419,600. CD 12/3.

▲ **Kan., Derby**—SCHOOL—Derby School Dist., Bd. Educ., voted $1,800,000 bonds, school and junior high schools.

▲† **La., Fort Polk**—HOUSING—U. S. Eng., Box 1229, Galveston, Tex., plans by Alexander, Dunaway & Jones and Johnson Brown & Butler, 2712 Danville Ave., Houston, Tex., consult. engrs. and archts., second section, incl. 1,000 units of permanent type family housing, $12,000,000.

La., Kaplan—HOSPITAL—Vermillion Parish Police Jury, c/o J. LeBlanc, pres., Court House, Abbeville, plans by Leviel H. Abshire, 3170 Florida St., Baton Rouge, hospital. $500,000.

▲† **Md., Camp Detrick**—HOUSING—U. E. Eng. First and Douglas Sts. N.W., Wash. 25, D. C., plans by John H. Graham & Milton Schwartz, 2430 Pennsylvania Ave. N.W., Wash., D. C., 64-unit Capehart Housing, $1,000,000-$3,000,000. CD 3/29/56, under Commercial Buildings.

▲ **Mass., Topsfield**—SCHOOL—Towns Topsfield, Middleton and Boxford, c/o J. Harrison Holman, chm. Planning Comm., 5 Lockwood Lane, plans by Rich & Tucker Assoc., 45 Newbury St., Boston, Junior, Senior Regional High School, $2,500,000. Constr. 1957-1958. CD 10/5.

Mich., Nankin—SCHOOL—Nankin Twp., H. E. Bertha Cooper School Dist., Livonia, plans by Bery-Klei & Assoc., 8440 West 9 Mile Rd., Oak Park, Junior High School. $500,000. CD 11/8.

Mich., Oak Park—PUBLIC SAFETY HEADQUARTERS—City, Glenford S. Leonard, public safety dir., public safety headquarters bldg. $400,000.

Minn., Hayfield—SCHOOL—Bd. Educ., Consol. School Dist., voted $950,000 bonds Apr. 12, new high school, $500,000, and imprv. existing bldgs., Hayfield and Sargeant. W. W. Kane, Austin, archt. CD 3/28.

▲† **N. J., Dover**—SPECIAL WEAPONS—U. S. Eng., 111 E. 16 St., New York 3, N. Y., special weapons bldg. at Picatinny Arsenal. $3,000,000-$5,000,000. Wigton-Abbott Corp., 1225 South Ave., Plainfield, consult. engrs.

▲† **N. J., Fort Monmouth**—HOUSING—U. S. Eng., 111 E. 16 St., New York 3, N. Y., 120 housing units, (Capehart). $1,000,000-$3,000,000. S. J. Kessler & Sons, 551 Fifth Ave., New York 17, N. Y., archts.

N. Y., Hilton—SCHOOL—Hilton Central School Dist., Hilton, bond election May 15, Junior-Senior High School addn. $600,000. CD 4/9.

▲ **N. Y., Lynbrook**—SCHOOL—Bd. Educ., defeated by referendum vote on Apr. 4, high school, Union Ave., $4,500,000. CD 3/11.

▲ **N. Y., New York**—HOSPITAL—Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, plans by Hart, Jerman & Assocs., 250 E. 43 St., New York, Zone 17, and Urbahn, Brayton & Burrows, 654 Madison Ave., Zone 21, mental hospital, on 124 acre site on Hutchinson River Parkway and Pelham Parkway. $70,000,000. CD 12/13/54.

▲ **N. Y., New York**—HEADQUARTERS—U. S. Coast Guard, Third Coast Guard Dist., 80 Lafayette St., Zone 13, Marine Headquarters Station on site of Old Barge Office, just west of Staten Island Ferry Terminal, $1,000,000.

† **N. Y., Syracuse**—TRAINING CENTER—U. S. Eng., 111 E. 16 St., New York, Zone 3, plans by Micheal J. DeAngelis, 522 Fifth Ave., New York, Zone 36, army training center. $500,000-$1,000,000.

O., Reynoldsburg—SCHOOL—Reynoldsburg Bd. Educ., Reynoldsburg, elementary school, $500,000.

▲ **O., Tallmadge**—SCHOOL—Bd. Educ., Tallmadge, High School, $1,250,000. Work this summer.

▲ **Pa., Willow Grove**—SCHOOL—Upper Moreland Twp. School Dist., Willow Grove, plans by Heacock & Platt, 1505 Race St., Phila., high school. $1,000,000. Allabach & Renis, Inc., 16 S. Broad St., Phila., engrs.

▲ **Tex., Austin**—LIBRARY, etc.—State of Texas, c/o Price Daniels, gov., Austin, library and archives and a general land office bldg. $2,500,000. CD 9/28/44.

Tex., Baytown—SCHOOL—Baytown Independent School Dist., Baytown, Robert E. Lee High School Auditorium, $500,000. CD 6/4.

Tex., La Porte—SCHOOL—La Porte Independent School Dist. Plans by Matt Howard Jr. & Assocs., engrs.-archts., 2444 Times Blvd., Houston, high school, $800,000. CD 4/11.

Tex., Port Arthur—HOSPITAL—Civic Group, c/o Munger T. Ball, chn., hospital, $750,000.

▲† **Utah, Ogden**—TEST FACILITY—Marquardt Aircraft Corp., 16555 Saticoy St., Van Nuys, Calif., test facility for Bomarc guided missile (ram jet) at Little Mountain, 15 mi. west of here. $15,000,000. CD 2/9/56, under Industrial Buildings.

▲ **Utah, Roy**—INFIRMARY, etc.—Bd. of Comrs, Weber Co., City-County Bldg., Ogden, bond election May 21, infirmary and chronic disease hospital. $1,500,000. Keith W. Wilcox, 427 Keisel Bldg., Ogden, archt. CD 3/28/56.

▲ **Wash., Edmonds**—SCHOOLS—School Dist. 15, Edmonds, plans by R. Burkhard, 2120 S.W. 152 St., Seattle, high school, $2,500,000; plans by Waldron & Dietz, 1411 4 Ave. Bldg., Seattle, Zone 1, elementary school, Mountlake Terrace, $500,000; plans by D. Miller, Edmonds, elementary school, $500,000. CD 4/26.

▲ **Wash., Moses Lake**—SCHOOL—School Dist. 161, Moses Lake, plans by Hovind, Harthorne & Smith, 1500 Westlake Ave. N., Seattle, high school. $1,400,000. Bids likely this summer. CD 10/5.

Wash., Spokane—SCHOOL—School Dist. 81, W503 4 St., plans by G. M. Rasque & Son, Washington Trust Bldg., 2 story, 56,500 sq. ft. rein.-con. technical-vocational school addn. $600,000. Bids next month. CD 11/14.

▲ **Wis., Sheboygan**—INFIRMARY, etc.—Sheyboygan Co., Court House, infirmary agd hospital, $2,000,000. CD 11/20/51.

▲ **Ont., Prescott**—HIGH SCHOOL—South Grenville District High School Bd., The Poplar, Maitland, plans by Drevor & Smith, 81 Brock St., Kingston, steel, concrete, brick high school, Edward St. $1,125,000. P. T. Mikluchin, c/o John B. Parkin Assocs., 1500 Don Mills Rd., Postal Station "J", Toronto, consult. engrs. CD 12/4.

COMMERCIAL BUILDINGS

▲ **Ala., Birmingham**—OFFICE—Belmont Corp., 505-19th St., Ensley, Birmingham, plans by Wilmot C. Douglas, 2922-7th Ave. S., 10 story, baked enamel on metal exterior office bldg. 300-car parking area, $2,300,000.

▲ **Ala., Birmingham**—SHOPPING CENTER, etc.—Myer Shiland, 2400-2nd Ave. N., plans by Lawrence Whitten, Brown-Marx Bldg., shopping center, parking on 12-acre tract, Bessemer Hy., $1,000,000; office bldg. to adjoin shopping center, $500,000.

Ala., Birmingham—OFFICE-PARKING—National Garage, Inc., 1813 1st. Ave., N., plans by Greer, Holmquist & Chambers, Stallings Bldg., 42,000 sq. ft. office space, office-Parking bldg., 350 car parking space, penthouse restaurant and roll-back roof, air-conditioned, $750,000

▲ **Calif., San Francisco**—RESIDENCE—University of San Francisco, 2130 Fulton St., residence for faculty, $1,240,000.

▲ **Conn., Brookfield**—HOUSES—John Gerstien & Philip Miller, c/o Dr. K. M. Kubisek, 301 Main St., Danbury, 50 houses, Longmeadow-Hill Road, $1,850,000.

Conn., Monroe—HOUSES—Greenfield Realty, 224 Broadbridge Ave., Bridgeport, 37 houses, Wheeler Rd. $370,000.

Conn., New Haven—LABORATORY, etc.—Yale University, 105 Wall St., plans by Douglas Orr, 111 Whitney Ave., 2 story Bingham Oceonographic Laboratory and Ornithology laboratory wing to Peabody Museum, $650,000. CD 6/26

▲ **Conn., Wallingford**—HOSPITAL UNITS—Gaylord Farm Sanatorium, Wallingford, two hospital units. $1,500,000. CD 5/16/45.

Ill., Elmhurse—CHURCH, etc.—Elmhurst Presbyterian Church, 443 Stratford St., plans by Walter Kroeber, 310 S. State Rd., Arlington Heights, church, sunday school and hall, St. Charles and Spring Rds. $450,000.

Ill., Joliet—WAREHOUSE—Sears Roebuck & Co., Arthington and Homan Aves., Chicago, plans by Dunlap & Esgar, Inc., 333 N. Michigan Ave., Chicago, 1 story, 47,000 sq. ft. brick warehouse, paving and railroad tracks, Maple and Benton Sts. $400,000.

Mass., Newton—MOTEL—St. Paul Constr. Co., 1440 Beacon St., Brookline, plans by Arthur G. Manaselian & Assoc., 30 Huntington Ave., Boston, 53 unit motel (Charterhouse Inn), Chestnut Hill and Worcester Turnpike. Over $700,000. Hotel Corp. of America, 400 Commonwealth Ave., Boston, lessee.

Minn., Minneapolis—GYMNASIUM, etc.—Augsburg College & Theological Seminary, 707 21st Ave. South, plans by Lang & Raugland, 802 Wesley Temple Bldg., gymnasium and auditorium at site, $400,000.

N. J., Paterson—DORMITORY—Diocese of Paterson and St. Joseph's Home for Aged, 46 Preakness Ave., dormitory to enlarge home, $345,000.

N. J., Mountain View—FELLOWSHIP HALL—Mountain View Community Methodist Church, Newark-Pompton Turnpike, plans by Shreve, Lamb & Harmon, 11 E. 44 St., New York, N. Y., fellowship hall on 12 acre site, 1 mi. north of existing church on Parish Dr. $500,000.

N. Y., Brooklyn—SYNAGOGUE—Beth Shalom of Kings Bay, 2710 Ave X, Zone 29, plans by Sidney H. Kitzler and Morris Hannes, 66 Court St., Zone 2, 2 story synagogue, 2702-2710 Ave. X, $344,000.

N. Y., Brooklyn—APARTMENT—Polyking Holding Corp., 1392 Utica Ave., Zone 3, plans by Morris B. Adler, 16 Court St., Zone 2, 6 story apartment, 787 E. 46 St. $500,000.

▲ **N. Y., New York**—APARTMENT—Irving Brodsky, 570 Seventh Ave., New York, Zone 36, 16 story apartment, Fifth Ave. and 86 St., $1,000,000.

▲ **N. Y., New York**—HOSPITAL—New York University, Bellevue Medical Center, 550 First Ave., Zone 16, plans by Skidmore, Owing & Merrill, 575 Madison

(Continued on page 158)

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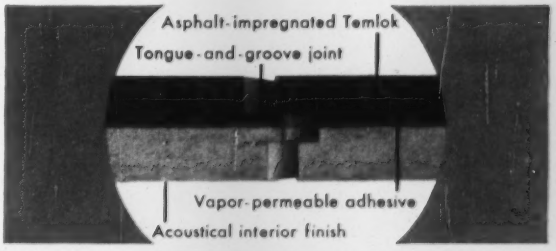

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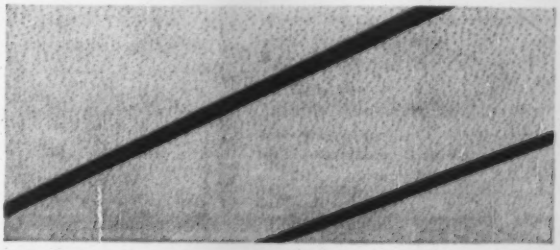

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(Continued from page 156)

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▲ **N. Y., White Plains**—CHURCH—Memorial Methodist Church, 273 Main St., plans by Ferrenz & Taylor, 152 W. 42 St., New York, Zone 36, church on 5 acre tract on Bryant Ave. $1,000,000.

▲ **O., Cincinnati**—OFFICE, etc.—Milner Enterprises, Inc., Milner Bldg., Jackson, Miss., plans by Hedrick & Stanley, T & P Bldg., Fort Worth, Tex., 30-story, 335,000 sq. ft. structural steel, office bldg. and 400-car self-park garage in offset. Central Parkway and Vine Sts., $7,000,000. Robt. Cline, Inc., Enquirer Bldg., C. engr.

O., Circleville—SHOPPING CENTER—Minhardt M. Crites & Assocs., Circleville, shopping center, 30-acre near southern edge of city and on east side of Rt. 23, Over $500,000.

O., Toledo—SCHOOL—Rosary Cathedral Parish, 2535 Collingwood, plans by Britsch & Macelwane, 2450 Sylvania St., 2 story school addn. $415,000.

O., Xenia—HOMES—Owner c/o Walter Mille, Xenia, 100 homes for faculty members of Central State College, 32-acre site, southeast of North Rt. 42, $500,000.

Okla., Oklahoma City—CAMERON BUILDING—C. W. Cameron, 2901 Classen St., plans by Sorey, Hill & Sorey, 809 N.W. 36 St., 2 story, bsmnt. Cameron Building addn. $500,000.

▲ **Tex., Dallas**—DWELLINGS—Lacy R. Keele & Son, 2911 S. Lancaster St., 14 dwellings, $357,500; 22 dwellings, $371,000; 18 dwellings, $373,500; 28 dwellings, $386,100; 24 dwellings, $366,200; 12 dwellings, $350,000, all in "Singing Hills". CD 3/8.

Tex., Houston—DWELLINGS—Brazosport Builders, 10002 Bessemer St., 32 brick veneer dwellings, 10,000 and 10100 Blk. Kittrell St. $508,000.

Tex., Houston—APARTMENT—Dr. James E. Dailey, 4109 Montrose St., plans by Jordan H. Lamb, c/o owner, apartment, 3300 Blk. Graustark St., $500,000.

▲ **Tex., Houston**—HOSPITAL—St. Joseph's Hospital, 1910 Crawford St., 11 story hospital, Labranch St., $4,500,000, constr. addnl. hospital units in 3-5 year program, $2,000,000.

▲ **Tex., Houston**—BOWLING CENTER—Miles Strickland, 2802 Louisiana St., 40-lane bowling center, 1418 Federal Rd. $1,000,000.

Tex., Lubbock—SCHOOL—St. Elizabeth's Catholic Church, c/o Thomas J. Drury, 2305 Main St., plans by Hugh Dryer, Jr. & Assoc., 1902 Ave. M, school. $400,000. CD 6/22.

Tex., San Antonio—SHOPPING CENTER—L. R. Pletz & Assocs., (Terrell Plaza Shopping Center) c/o Marmon-Mok, archts., 613 South Texas Bldg., constr. 2nd phase shopping center, Austin Hy. opposite the Westerner $750,000. CD 2/5.

▲ **Wash., Bellingham**—SHOPPING CENTER—B. Haggen, White House Market, Railroad and Magnolia Sts., plans by B. Woo, 1635 34th Ave., Seattle, 127,750 sq. ft. town and country shopping center. Meridian and Illinois Sts. $1,000,000.

▲ **Wis., Waupaca**—SEMINARY—Blessed Sacrament Fathers, Waupaca, plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, Minor Seminary, $1,000,000.

Ont., Toronto—HOSPITAL—St. Bernard's Convalescent Hospital, c/o J. E. Hoare, Jr., archt., 481 Eglington Ave. W., part 2 and 3 story, T-shaped with one arm 37x103 ft. and one 29x93 ft., hospital addns. $500,000. Wallace, Carruthers & Assocs. Ltd., 92 Yorkville Ave., consult. engrs.

▲ **Que., Alma**—HOUSING—Service de Transactions Ltee., 45 rue du Sacre-Coeur Alma, 200 houses and 25 stores on Route Regionale between Alma and St. Bruno. $1,000,000.

▲ **Que., Montreal**—APARTMENT PROGRAM—Riverside Housing, Inc., 5210 Van Horne Ave., 193 three-story apartment blocks, new streets, Ville La Salle. Over $2,000,000.

▲ **Que., Montreal**—DPT. OF MEDICINE—Bd. Governors, Royal Victoria Hospital, Pine Ave. W., plans by Barott, Marshall, Merett & Barott, 1425 Mountain St., 9 story dept. of medicine bldg. $5,000,000. Lindley, Shector, 1425 Mountain St., consult. engr. CD 4/12/51.

Que., Thetford Mines—COLLEGE—College Classique de Thetford Mines, Thetford Mines, plans by J. Berchmans Gagnon, 97 Notre Dame South Thetford Mines, classical college, $700,000.

INDUSTRIAL BUILDINGS

Ala., Port Birmingham—PLANT—Sinclair Refining Co., 5 W. 48th St., New York, N. Y. 200x200 ft. canning plant on Warrior River for bulk oil. $750,000.

▲ **Conn., Bloomfield**—RESEARCH CENTER, etc.—Royal-McBee Corp., Bloomfield, 2 story, landscapped grounds, 75,000 sq. ft. research and development center, Campus Type, Maple Ave. $2,000,000. Construction soon. Elmer H. Dreher, c/o owner, research engr.

▲ **Ind., Indianapolis**—LABORATORY, etc.—Eli Lilly & Co., Alabama and McCarty Sts., plans by D. A. Bohlen & Son, State Life Bldg., 3 story, electronic data processing equip. laboratory and office, S. Alabama St. and McCarty St., $3,500,000. CD 10/2.

▲ **Kan., Kansas City**—PLANT—Brown-Strauss Corp., 1546 Guinotte St., Kansas City, Mo., 100,000 sq. ft. fabrication plant, railroad tracks. $1,000,000. S. J. Callahan & Co., 1009 Baltimore St., Kansas City, Mo., consult. engrs.

▲ **Ky., Louisville**—RESEARCH UNIT, etc.—Reynolds Metals Co., Reynolds Bldg., Richmond, Va., plans by Eero Saarinen, West Long Lake Rd., Bloomfield Hills, Mich., research unit and office bldg., Newbury Rd. and Watterson Expressway, $5,000,000. CD 4/2/53.

▲ **Md., Bladensburg**—PLANT—High's Dairy Products Co., 1326 Half St. S. E., Wash., D. C., processing plant at Kenilworth Ave., Upshur St. to 49 Ave. $1,000,000.

▲ **Tenn., Memphis**—PLANT—Publication Corp., (This Week Mag.) 640 5th Ave., New York, N. Y., 260x180 ft. steel, masonry plant, in suburban Whitehaven, $1,400,000.

▲ **Tex., Arlington**—INDUSTRIAL—Great Southwest Corp., 401 Wynnewood Village, Dallas, Industrial Bldg. No. 6, $650,000; Industrial Bldg. No. 5, $500,000; Industrial Bldg. No. 4, $750,000.

▲ **Tex., Houston**—PLANT—Maxwell House Division, General Foods Corp., 3906 Harrisburg Blvd., coffee plant expansion. $6,000,000.

▲ **Tex., Houston**—PLANT, etc.—Oil Center Tool Co., 1912 Airline Rd., plant addn., $1,500,000; warehousing, $200,000.

▲ **Wisconsin**—GENERATING UNIT, etc.—Dairyland Power Co-operative, 2615 East Ave. S., La Crosse, 75,000 kw. reheat, steam electric generating unit at plant, near Alma, $12,000,000; 38 mi. 161-kv transmission line, 130 mi. of 69 kv line and 227 mi. 34.5 kv. line and sys. imprvs. $6,450,000. CD 2/13/51, under Unclassified.

Ont., Toronto—WAREHOUSE—Central Storage Co., 1376 Eglinton Ave. W., reconstr. 4 story, brick warehouse, 22 Mark St. $500,000.

▲ **Ont., Toronto**—PARTS DEPOT, etc.—Ford Motor Co. of Canada Ltd., 120 Bloor St. E., plans by Allwarc & Gouinlock, 245 Davenport Rd. parts and accessories depot, 41-acre tract south of Sheppard Ave. W. $1,000,000. CD 12/31.

UNCLASSIFIED

Calif., Santa Cruz—PARKING LOTS—City, c/o Clerk, City Hall, off street parking lots; Front St. between Palomar Arcade and Vons Market, Cedar St., Vine St., Church St. $650,000.

▲ **Ga., Atlanta**—PARKS—Atlanta Parks Dpt., City Hall, voted bonds, city parks imprvs. $1,000,000. CD 6/21/46.

▲ **Kan., Kansas City**—RAILROAD YARD—Union Pacific R. R., J. A. Bunjer, ch. engr., 1416 Dodge St., Omaha 2, Neb., railroad yard, 4 block long freight house and office in 2 story 1,106 ft. bldg. incl. 15 new bldgs. to handle 16 engines at once. $8,000,000.

† **Kan., Wichita**—AIR-CONDITIONING, etc.—General Services Admin., Pub. Bldgs. Services, General Services Bldg., 19 and F Sts. N. W., Wash. 25, D. C., plans by Wilson & Co., engrs.-archts., 705 E. Crawford St., Salina, air-conditioning and new lighting systems at Federal Bldg. $680,000.

† **New York and New Jersey**—POWER FACILITIES—U. S. Eng., 111 E. 16 St., New York 3, N. Y., power facilities at ACW site, $500,000-$1,000,000, Zimmerman Engr. Co., 500 Fifth Ave., New York 36, N. Y., engr.

▲† **New York**—AAA FACILITIES—U. S. Eng., 111 E. 16 St., New York, plans by James P. O'Donnell, 39 Broadway, New York, control bldg. (FY 56) New York Area, $500,000-$1,000,000. Bids about Aug. 15; FUIF rooms at AAA facilities New York and Niagara Areas, $100,000-$500,000. Bids on or about Aug. 1; plans by Amman & Whitney, 11 Eighth Ave., New York, Zone 11, control bldg. at AAA facilities, Niagara area, $500,000-$1,000,000. Bids on or about Aug. 15.

† **N. Y., Oswego**—MISCELLANEOUS FACILITIES—U. S. Eng., 111 E. 16 St., New York, Zone 3, misc. facilities at AAA Support Facilities, $100,000-$500,000. Duane Lyman Assocs., 505 Delaware Ave., Buffalo, engrs.

O., Cleveland—SHEETING—City, Dpt. Port Control, Wm. J. Rogers, dir., City Hall, Zone 14, sheeting exten. along east side of W. 3 St. Pier, $500,000. Osborn Eng. Co., 7016 Euclid Ave., Zone 3, consult. engr. CD 11/10/55.

▲ **S. C., Charleston**—PORT FACILITIES—S. C. State Ports Auth., 1 Vendue Range, Charleston, port facilities, $18,000,000. Lockwood Greene Engineers, Inc., Montgomery Bldg., Spartansburg, S. C., and Palmer & Baker, Inc., 957 Springhill Ave., Mobile, Ala., consult. engrs. CD 2/18, under Public Buildings.

▲ **S. C., Georgetown**—PORT FACILITIES—S. C. State Port Auth., 1 Vendue Range, Charleston, port facilities, $1,500,000. Lockwood Greene Engineers, Inc., Montgomery Bldg., Spartansburg, S. C., and Palmer & Baker, Inc., 957 Springhill Ave., Mobile, Ala., consult. engrs.

▲ **S. C., Port Royal**—PORT FACILITIES—S. C. State Port Auth., 1 Vendue Range, Charleston, port facilities, $1,500,000. Lockwood Greene Engineers, Inc., Montgomery Bldg., Spartansburg, S. C. and Palmer & Barker, Inc., 957 Springhill Ave., Mobile, Ala., consult. engrs. CD 2/18, under Public Buildings.

▲ **Tex., Fort Worth**—MAUSOLEUM—Greenwood Cemetery, c/o Jno. T. Bailey, mgr., c/o Harwell, Hamilton, Harris, archts., 3613 W. 7th St., 1st ½ of Phase 1, marble interior and floors Mausoleum No. 1, at Mt. Olivet Cemetery, NE 28th and Sylvania St., $2,250,000; 2nd ½ Phase 1, marble interior and floors, Mausoleum No. 2, at University Dr. and Whitesettlement Rd., $2,250,000; Phase No. 2, mortuary, administration offices, hard-paved parking area, $400,000.

▲ **Ont., Hamilton**—STADIUM—Hamilton Parks Bd., City Hall, stadium off Greenhill Ave., between Kenilworth Dr. and Aberfoyle Ave. $2,000,000. CD 10/10/45.

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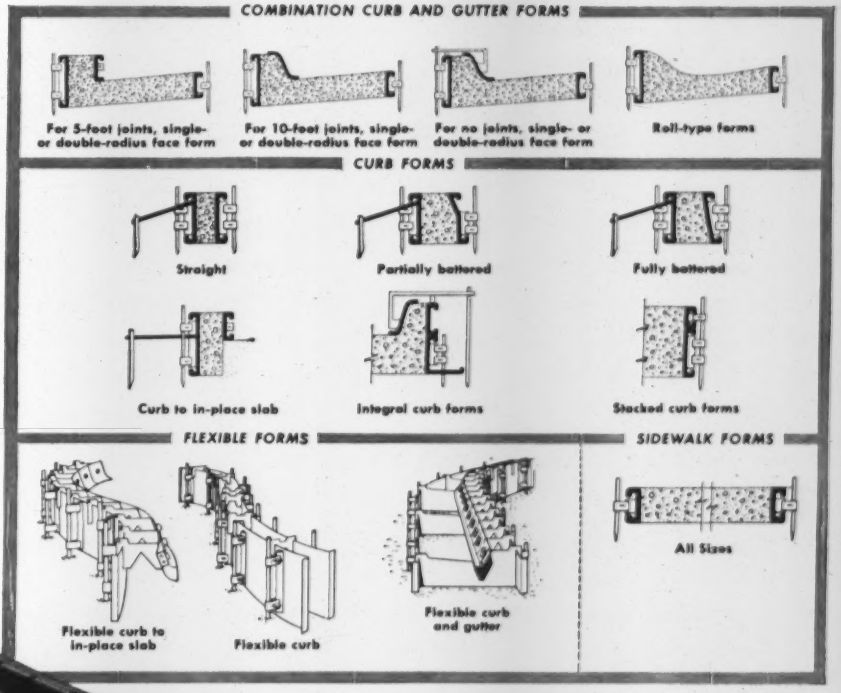

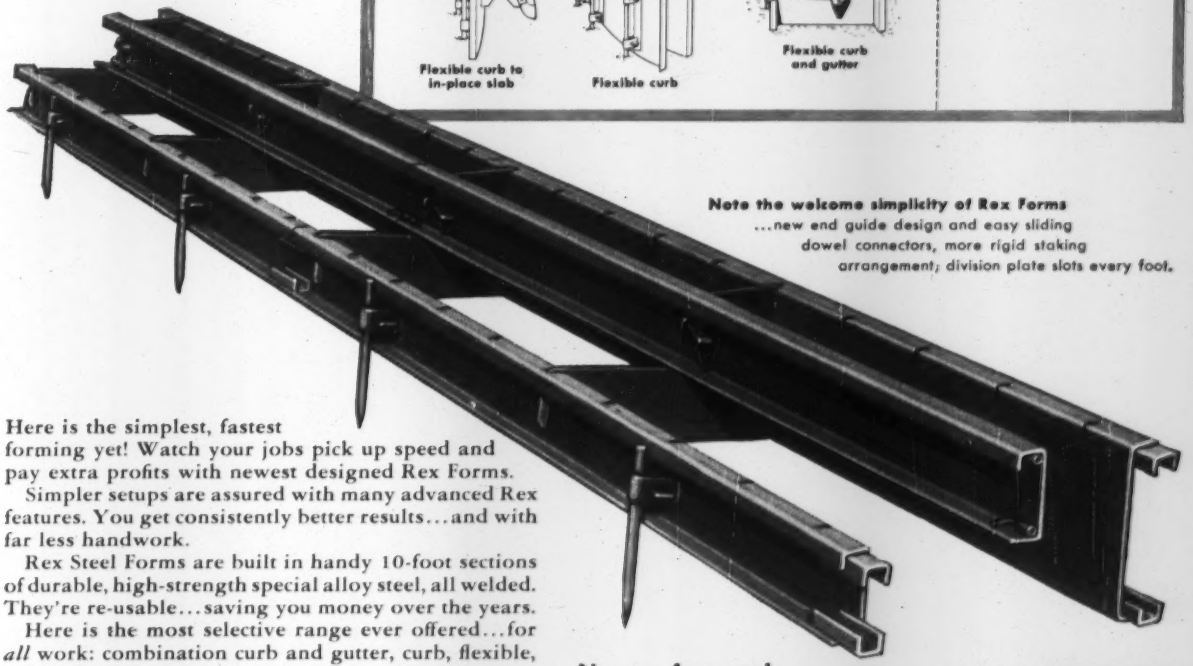

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 27 Connecticut

STREETS AND ROADS

May 27 Connecticut

† **Mass., Falmouth**—HIGH TEMPERATURE HOT WATER DISTRIBUTION SYS.—BA 5/27—U. S. Eng., 150 Causeway St., Boston, high temperature hot water distr. sys., Otis Air Force Base, ENG-19-016-57-212. $800,000-$1,000,000. Plans deposit $15. CD 5/8.

HEAVY CONSTRUCTION—LB & CA

† **J. R. Cianchette,** Main St., Pittsfield, Me., LB **$950,-890,** est. $1,000,000, sewerage treatment plant and site preparation work, Dow Air Force Base, IFB-17-601-57-45, BANGOR, ME. Base Procurement Officer, Headquarters, 4060th Air Base Group, Dow Air Force Base, Bangor, Me. CD 4/22, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston. Bids opened 5/7.

M. Dematteo Constr. Co., 200 Hancock St., Quincy, Mass., LB **$6,108,543,** constr. section of J. F. Fitzgerald Expressway on rein.-con. viaduct from Dover St. to Union Park St. F. A. No. 1-352 (2) Contr. N. Boston. CD 4/11.

DiMinico & Pallotta, 6 Pleasant St., Malden, Mass., LB **$896,915,** est. $900,000. South Charles Relief sewer, Newton Line to Farwell St., Waltham, No. 232, Section 4A, BOSTON, MASS. Commonwealth of Mass., Metropolitan Dist. Comn., Constr. Div., 20 Somerset St., Boston, Mass. CD 4/17.

▲ **Johnson Brothers, Inc.,** 542 Southbridge St., Auburn, Mass., LB **$1,122,612,** water supply main, NEW BEDFORD, MASS. City Dpt. P. Wks., City Hall, New Bedford, Mass. Bids May 6. CD 4/26.

CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford,

Enfield Road Constr. Co., Inc., Depot Hill, Warehouse Point, Conn., CA **$819,000.** Proj. 329-05, dual service stations, incl. site imprvs., site utilities, landscaping, exterior lighting, product piping tanks, pump, etc., in Plainfield. Bids Apr. 18, awarded May 3. CD 4/23, under LB.

BUILDINGS—LB & CA

▲ **White Constr. Co.,** 376 Boylston St., Boston, Mass., CA **$1,758,000,** est. $1,700,000, East JUNIOR High SCHOOL, BROCKTON, MASS. City, Edwin A. Nelson, supt. Schools, City Hall, Brockton, Mass. CD 4/12, under LB.

Grande & Son, Inc., 175 Maplewood St., Malden, Mass., LB **$900,334.** M-808, SCHOOL, State School WRENTHAM, MASS., Commonwealth of Mass., Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. CD 4/11.

▲ **New England General Contg. Co.,** 341 State St., New Haven, Conn., CA **$2,029,400.** CA East Side (Francis Maloney) HIGH SCHOOL, MERIDEN, CONN. Bd. Educ., 22 Liberty St., Meriden, Conn. CD 4/30, under LB.

▲ **Paul Tishman General Contractors, Inc.,** 21 E. 70 St., New York, N. Y., LB **$3,734,000** (4 bidders) Proj. BI-K-102, INTENSIVE TREATMENT BLDG., Norwich State Hospital, NORWICH, CONN. State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn. Bids May 8. CD 4/11.

▲ **Brooklawn Constr. Co.,** 254 Prospect Ave., Hartford, Conn., LB **$1,071,000** (2 bidders) moderate rental HOUSING, Proj. MR 63, WINSTED, CONN. Town Housing Auth., Town Hall, Winsted, Conn. Bids Apr. 30. CD 4/17.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 24 Pennsylvania

STREETS AND ROADS

May 21, 23 New Jersey May 23 New York

May 24 Pennsylvania

▲ **N. Y., Mineola**—BA5/28—Nassau Co. Executive, Nassau Co., Old County Court House, lateral sewers at Baldwin and vicinity of Town of Hempstead, Sewage Collection Dist. No. 2-B, Contr. No. 1002-28-5, $2,250,000. Plans deposit $25.

BUILDINGS—BA

▲ **N. Y., New York**—HOSPITAL—BA 5/20—Hospital Building Corp., 2396 Tiebout Ave., 6 story hospital, Pelham Parkway South and St. Paul Ave. $2,500,000. Anthony J. DePace, 151 W. 46 St., Zone 19, archt. CD 3/4.

▲ **N. Y., Massapequa**—SCHOOL—BA 5/27—Bd. Educ., Massapequa, Junior High School, Roosevelt Ave. and Spruce St. $3,400,000. George J. Dippell, 124 Merrick Rd., archt. CD 2/26.

HEAVY CONSTRUCTION—LB & CA

▲ **West Delaware Tunnel Contractors** (Johnson, Drake & Piper, Inc., Winston Brothers Co. Tecon Corp. and Conduit & Foundation Co.)., Roscoe, N. Y., CA **$26,241,750** Contr. 454, 60,000 lin. ft. tunnel incl. Shaft 5 approx. 760 ft. deep and Shaft 6 approx. 780 ft. deep located in towns of Rockland and Neversink, Sullivan Co., CA **$19,198,700.** Contr. 455, 42,000 lin. ft. tunnel incl. Shaft 7, approx. 650 deep and tunnel outlet located in town of Neversink, Sullivan Co., easterly portion of the West Delaware Tunnel, Delaware System, NEW YORK. Bd. Water Supply, 120 Wall St., New York 5, N. Y. Bids Apr. 23. CD 4/25, under LB.

▲† **Merritt-Chapman & Scott Corp.,** 260 Madison Ave., New York 16, N. Y., CA Est. **$4,150,000.** dredging South Cornwall channel, 500,000 cu. yd. material and removal of old Roosevelt Bridge, NEW YORK. St. Lawrence Development Corp., c/o U. S. Eng., foot of Bridge St., Buffalo 7, N. Y. CD 3/29, under LB.

▲† **Construction Service Co.,** Lincoln Blvd., Box 311, Bound Brook, N. J., LB **$1,748,666** (7 bidders) concrete masonry dam and accessories on east branch of Fish Creek, approx. 17 mi. northwest of ROME, N. Y. City, City Hall, Rome, N. Y. Bids May 6. CD 4/15.

▲† **Hendrickson Bros., Inc.,** 63 N. Central Ave., Valley Stream, N. Y., CA **$1,939,203.** runway extens., Suffolk County Air Force Base, ENG-30-075-57-340, WESTHAMPTON BEACH, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Mar. 14, awarded May 6. CD 3/19, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg. Bids opened 5/3.

Pa.—**New Enterprise Stone & Lime Co.,** New Enterprise, Pa. LB **$984,891** (2 bidders), 29,826 ft. cr. aggreg. base with bit. surf. 22 ft. wide, Roaring Spring Boro, Taylor Twp. T.R. 36, Blair Co.;

Pa.—**D. E. Smith, Inc.,** Mifflintown, Pa., LB **$675,408,** (4 bidders), 4,140 ft. cr. aggreg. base with bit. surf. variable in width, Spring and Walker Twps. T.R. 550-64, Centre Co.;

Pa.—**Tri-State Asphalt Corp.,** S. Broadway and Aetna St., Martins Ferry, O. LB **$155,644** (7 bidders) surf. 32,939 ft. existing road with bit. surf. variable in width, Decatur; Boggs and Lawrence Twps., Clearfield Boro, T.R. 322, Clearfield Co.;

Pa.—A. E. Oblock, Unity, Pa. LB **$1,159,355** (2 bidders) 41,535 ft. cr. aggreg. base with bit. surf. 22 ft. wide, L.R. 24035 (1-2), Benezette Twp., Elk Co.;

Pa.—Union Paving Co., 1 E Wynnewood Rd., Wynnewood, Pa., LB **$1,744,400** (4 bidders), wid'n, partial replacement 25,386 ft. cr. aggreg. base with bit. surf. variable in width, incl. 1 plate girder and 4 I-beam bridges, T.R. 31, Huntingdon, Sewickley and Hempfield Twps., Westmoreland Co. CD 4/11.

▲† **Ritter Brothers,** 1511 N. Cameron St., Harrisburg, Pa., LB **$5,896,277.** Special AMC Warehouses, supporting facilities, Olmsted Air Force Base, SN. 18-020-57-37, MIDDLETOWN, PA. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. Bids May 8. CD 4/25.

Reisinger Bros., Inc., E. North St. Extended, Carlisle, Pa., CA **$889,000,** est. $950,000 reconstr. and enlarging sewage plant, CARLISLE, PA. Boro Sewer Sys. Auth., Boro Hall, Carlisle, Pa. Bids Apr. 9, awarded May 1. CD 4/16, under LB.

BUILDINGS—LB & CA

▲ **Vincent J. Smith Constr. Co.,** Box 551, Binghamton, N. Y., CA Est. **$1,000,000.** DORMITORY and LIBRARY, CALLICOON, N. Y. St. Joseph's Seraphic Seminary, Callicoon, N. Y. Emery Roth & Sons, 575 Madison Ave., New York 22, N. Y., archts. Bids Mar. 22.

Robert F. Hyland & Son, 375 Averill Ave., Rochester, N. Y., LB **$845,929,** HIGH SCHOOL addn. and swimming pool IRONDEQUOIT, N. Y. Irondequoit Central School Dist. No. 3, Irondequoit, N. Y. Bids Apr. 11. CD 4/9.

▲ **HRH Constr. Corp.,** 16 W. 46 St., New York 19, N. Y., LB **$17,138,000** (5 bidders) general contract Castle Hill HOUSES (Proj. NYS-76) in area bounded by Seward, Castle Hill, Cincinatus, Havemeyer, Lacombe and Olmstead Aves., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 2299 Broadway, New York 7, N. Y. Bids May 7. CD 5/3;

Harry Starkman & Bros., 348 Brook Ave., New York 54, N. Y., LB **$1,378,000** (7 bidders) heating and ventilating for Castle Hill Houses (New York, N. Y.);

Herman H. Schwartz, Inc., 179 S. Portland Ave., Brooklyn 17, LB **$1,048,750** (11 bidders) electrical work for Castle Hill Houses (New York, N. Y.);

J. L. Murphy, Inc., 340 E. 44 St., New York 17, N. Y., LB **$2,229,000** (8 bidders) plumbing work for Castle Hill Houses (New York, N. Y.);

Seaberg Elevator Co., Inc., 243 44 St., Brooklyn, N. Y., LB **$489,324** (5 bidders) elevators for Castle Hill Houses (New York, N. Y.).

▲ **John W. Ryan Constr. Co.,** 11 W. 42 St., New York 36, N. Y. CA Est. **$3,000,000.** MOTHER HOUSE, WARWICK, N. Y. Archdiocesan Comn., 451 Madison Ave., New York 22, N. Y. Brother Cajetan, 44 Whitehall St., New York 4, N. Y., archt.

Sherwood Development Co., Pittsfield Way, New Providence, N. J. Owner Builds, **$800,000.** 30 HOUSES, Mountain Ave. and Richland Dr., "Richland Park", SPRINGFIELD, N. J. Silberstein & Silberstein, 200 Wood Ave., North Linden, N. J., archts.

▲ **Wellmore Builders Inc.,** Mountain Ave., New Providence, N. J., Owner Builds. **$2,000,000** 47 HOMES, Drumm Hill and Club Drs., SUMMIT, N. J.

▲ **Uniontown Constr. Co.,** 144 E. Main St., Uniontown, Pa. LB **$1,198,000** general contract JUNIOR-SENIOR HIGH SCHOOL for Bethlehem Joint School Bd., FREDERICKTOWN, PA. Pub. School Bldg. Auth., 101 S. 25 St. Harrisburg, Pa. Bids May 2. CD 4/3.

▲ **Samuel N. Zarpas, Inc.,** 2503 50 Ave., Tuxedo, (Hyattsville) Md., LB **$1,173,200** general construction, 1 story, steel brick, Fort Cherry JUNIOR SENIOR HIGH SCHOOL, McDONALD, PA. Fort Cherry Joint School Auth., McDonald, Pa. Bids Apr. 10. CD 3/25.

▲ **Housing Engineering Co.,** 1229 West Mount Royal Ave., Baltimore, Md., CA Est. **$3,000,000** 87-unit cooperative deluxe APARTMENT, S.E. corner of Park Heights Ave. and Seven Mile Lane, BALTIMORE, MD. Park Terrace Apartment, Inc., c/o Corning & Moore, archts., 1302 18 St. N.W., Wash., D. C.

▲ **Cavalier Constr. Co.,** 4931 Bethesda Ave., Bethesda, Md., Owner Builds, **$4,000,000.** 77 HOMES, Marbury Rd. and Landon Lane, BETHESDA, MD. Howard Titlow, 6505 Lux Lane, Bethesda, Md., archt.

▲ **Blake Constr. Co.,** 33 "E" St. S.W., Wash., D. C., Owner Builds, **$4,000,000.** 13 story L-shaped OFFICE, 1114-16 Connecticut Ave. N.W. and 1749 L St. N.W., WASH., D. C. John H. Graham & Milton Schwartz, 243 Pennsylvania Ave. N.W., Wash., D. C., archts.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 21 West Virginia

STREETS AND ROADS

May 21 West Virginia May 22 Louisiana

HEAVY CONSTRUCTION—LB & CA

▲† **Tidewater Constr. Corp.,** 538 Front St., Norfolk, Va., CA **$2,018,732.** waterfront facilities, and utilities, at Minecraft Naval Base, NBy 13174, CHARLESTON, S. C. P. Wks. Officer Dpt. Navy, Naval Base, Charleston, S. C. CD 8/27.

▲† **Roberson Constr. Co.,** 1513 Lyon St., Columbia, S. C., LB **$1,183,035;** reserve officers' hangar and pumping station, Donaldson Air Force Base, ENG-38-081-57-27, GREENVILLE, S. C. U. S. Dist. Eng., Custom House, Charleston, S. C. Bids Apr. 30. CD 4/29.

▲ **GEORGIA**—State Hy. Dpt., General Office, No. 2 Capitol Sq., Atlanta, Bids opened 5/3.

Ga.—**Seaboard Constr. Co.,** Box 567, Brunswick, Ga., LB **$121,061,** grading, paving 5.546 mi. Richmond Hill-Fancy Bluff Rd., State Rte. 63, beginning at end of existing pavement approx. 9 mi. southeast of Richmond Hill and extending southeast, S-0630 (2), Bryan Co; LB **$111,746,** grading, paving 3.405 mi. Bay City-Pearson Road, State Rte. 64 beginning at State Rte. 168 approx. 16 mi. east of Ray City and extending northeast toward Pearson, S-1218 (1), Lanier and Atkinson Counties;

Ga.—**Coffee Constr. Co.,** Eastman, Ga., LB **$245,837** grading, paving, 1 bridge 12.537 mi. Midville-Louisville Rd. State Rte. 17, beginning at State Rte. 78 approx. 5 mi. northwest of Midville and extending northwest to State Rte. 24 in Louisville S-1260 (1), Burke and Jefferson Counties;

Ga.—**Shepherd Constr. Co., Inc.,** 1800 Briarcliff Rd. N.E., Atlanta, Ga., LB **$162,642,** grading, paving, 1 bridge 7.86 mi. Waynesboro-Saint Clair Rd., FAS Route 1290 beginning at end of present pavement, approx. 6 mi. northwest of Waynesboro and extending west to State Rte. 80 approx. 11 mi. east of Wrens, S-1290 (1), Burke Co.;

Ga.—**H. M. Pafford, Jr., Waycross, Ga., LB $534,-557,** grading, paving 13.628 mi. Waverly-Atkinson Rd. State Route 110, beginning at State Route 25, U. S. Rte. 17 in Waverly and extending northwest to State Rte. 50 approx. 8 mi. east of Nahunta S-0607 (1), Camden and Brantly Counties;

Ga., **D. W. Bailey Contracting Co.,** Forest Park, Ga., LB **$551,441,** grading, paving, 3 bridges 13.803 mi. Columbus-West Point Road, State Rte. 103, beginning at Intersection of State Rtes. 103, 116 and 219 approx. 20 mi. north of Columbus and extending northwest to State Rte. 18 approx. 1 mi. east of West Point S-0652 (2), Harris and Troup Counties;

Ga.—**R. T. Smith,** 1309 East Ponce deLeon Ave., Atlanta, Ga., LB **$111,470,** grading, paving, 1 bridge 2.268 mi. LaGrange, Ga.-Rock Mills, Ala. Road, State Rte. 109 beginning at end of present pavement approx. 13 mi. northwest of LaGrange and extending northwest to Alabama State Line S-0740 (2), Heard Co.;

Ga.—**Wilkes Constr. Co.,** Washington, Ga., LB **$270,-000,** grading, paving, 2 bridges Crawfordville-Lexington Rd., State Rte. 22 beginning at point near north city limit of Crawfordville and extending north to State Rte. 44, S-0785 (2), Taliaferro Co. CD 4/24.

▲ **GEORGIA**—State Hy. Dpt., General Office, No. 2 Capitol Sq., Atlanta, Bids opened 5/3.

Ga.—**Scott Constr. Co., Inc.,** Thomasville, Ga., LB **$577,639,** 6 bridges on new graded section of Nahunta-Jesup Rd., State Rte. 23, U. S. Route 301 located parallel to present paved hy. approx. 5 mi. north of Nahunta, F-085-1 (5), Contract 1, Brantley Co.;

Ga.—**Bristol Steel & Iron Works, Inc.,** Bristol, Va., LB **$855,080,** furnishing structural steel for bridges at Hunter St., Georgia Railroad, Decatur Street and

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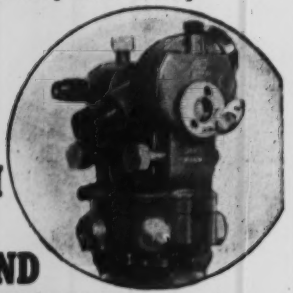

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Bell Street on Atlanta North-South Expressway, 1 401-2 (9), Contract 1, Fulton Co.;
Ga.—**Trussell Constr. Co.**, Columbus, Ga., LB **$108,792**, widening bridge at Bull Creek, incl. 724 ft. widened approaches on Columbus-Buena Vista Rd., State Rte. 103 near city limits of Columbus, SAP 1548-C (9), Muscogee Co.;
Ga.—**Americus Eng. & Constr. Co.**, Americus, Ga., LB **$135,893**, new bridge and paved approaches 0.748 mi. Ichawaynochaway Creek, west of Dawson on Dawson-Cuthbert Rd., State Rte. 50, U.S. Rte. 82 F 031-1 (1), Terrell Co. CD 4/24.

▲† **Blair Constr. Co.**, 1st National Bank Bldg., Montgomery, Ala., LB **$1,018,628**, est. $1,012,047, (7 bidders) two dormitory bldg. and dining hall bldg., Stewart Air Force Base, ENG-40-058-57-18, SMYRNA, TENN. U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn. Bids May 1, CD 4/3.

BUILDINGS—LB & CA

▲ **R. L. Bernard & Sons**, 1889 Galloway St., Memphis, Tenn., CA **$5,342,000**. CITY HALL, CIVIC AUDITORIUM, 2 marinas, marine service facilities, parking areas, PANAMA CITY, FLA. City, City Hall, Panama City, Fla. Bids Feb. 7, awarded May 1. CD 2/12, under LB.

▲ **O'Brien & Padgett**, 283 Scott Ave., Memphis, Tenn., CA **$1,864,000**; constr. 19 STORES, in Highland-Popular Plaza Shopping Center, MEMPHIS, TENN. John B. Goodwin Co., 62 Prescott St., Memphis, Tenn. Everett Woods & Assocs., 212 Memphis Ave., Memphis, Tenn. archts. Awarded Apr. 30.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 22 Michigan
STREETS AND ROADS
May 22 Michigan

BUILDINGS—BA

▲† **Ill., Great Lakes**—HOSPITAL—BA 6/20—Ninth Naval Dist., Great Lakes Training Center, Great Lakes, 12 story, 5,877,000 cu. ft., 800-bed, steel frame, concrete floors, brick, hospital, Spec. 5576/56. $5,000,000. CD 1/11/56.

HEAVY CONSTRUCTION—LB & CA

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,
Robert A. Black, Inc., 13912 S. Halsted St., Chicago, Ill. and **Lewis Shaw**, Decatur, Ill., CA **$1,298,826**, c. conc. base wid'n. 5.4 mi. and 6.24 mi. SBI 1, Mt. Carmel north, Wabash and Lawrence Counties. Bids Apr. 5. CD 4/10, under LB.

ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,
Calumet Coal Co. & Chas J. Wilson, 7601 S. Wentworth St., Chicago, Ill., CA **$945,454**, c. conc. 0.24 mi. FAI-9, 130 St., Cook Co. Bids Apr. 5. CD 4/10, under LB.

▲ **Louis Garavaglia**, 24240 Mound Rd., Centerline, Mich. CA **$2,239,800**, Contr. No. SE-2, constr. and sinking of caisson for raw water booster pumping stations at Water Works Park Station, DETROIT, MICH. Bd. Water Comrs., Water Bd., Bldg., 735 Randolph St., Detroit 25, Mich. Bids Feb. 26. CD 3/20.

BUILDINGS—LB & CA

Dunlop & Johnston, Inc., 19220 Miles Ave., Cleveland 28, O., CA Est. **$810,000**. AUDITORIUM and extra CLASSROOM BLDG., CLEVELAND O. The Temple, Ansel Rd. and E. 105 St., Cleveland 6, O. Awarded Apr. 30. CD 4/15, under LB.

Mosser Constr. Co., Fremont, O., CA **$602,500**. HIGH SCHOOL, HURON, O. Bd. Educ., Huron, O. Bids Apr. 23, awarded Apr. 30. CD 4/10.

Greenwood Realty Co., M. A. Lasiter & Cyrus Davis, Greenwood, Ind. Owner Builds. **$750,000**. HOUSING, Suburban Acres Development, GREENWOOD, IND.

Fred Teitelbaum Constr. Co., 5526 N. Kedzie Ave., Chicago, Ill., CA **$800,000**. 1 story, 185,000 sq. ft., brick, WAREHOUSE, OFFICE BLDG., and railroad tracks, 4101 W. District Blvd., CHICAGO, ILL. International Parts Corp., 1021 S. State St., Chicago, Ill. Bids Apr. 19. CD 4/10.

▲ **Joseph J. Duffy Co.**, 4994 N. Elston Ave., Chicago, Ill., CA **$2,892,989**. John Marshall Harlan HIGH SCHOOL, 98 St. and Michigan Ave., CHICAGO, ILL. Bd. Educ., 228 N. La Salle St., Chicago, Ill. CD 4/25, under LB.

▲ **Krieghoff-Lenawee Co.**, Adrian, Mich. CA **$2,241,241**, general contract HIGH SCHOOL, ADRAIN, MICH., City, Bd. Educ., Adrian, Mich. Bids Mar. 28. CD 4/10, under LB;
Industrial Piping & Eng. Co., 1340 Grant St., Fort Wayne, Ind. CA **$942,973**, mechanical work for high school (Adrian Mich.)

▲ **A. Z. Shmina & Son Co.**, 122 North 4th Ave., Ann Arbor, Mich. LB **$1,525,000**, general contracts Project No. 50, MUSIC BLDG., School of Music, University of Michigan, ANN ARBOR, MICH. Regents of University of Michigan, W. K. Pierpont, vice pres., Plant Service Bldg., North University and Forest Ave., Ann Arbor, Mich. Bids Apr. 25. CD 4/2;
Farrington Co., 15100 Castleton St., Detroit, Mich. LB **$525,000**. mechanical work for music bldg., (Ann Arbor, Mich.).

Fred Entenman, Inc., 3323 Secor Rd., Toledo, O. CA **$847,000**, HIGH SCHOOL, BLISSFIELD, MICH. Bd. Educ., Blissfield Community School District, Blissfield, Mich. CD 4/4.

Summit Constr. Co., Lansing, Mich. LB **$759,000**, general contract NURSERY BLDG., Mt. Pleasant State Home & Training Bldg., MOUNT PLEASANT, MICH. State, A. N. Langlus, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. Bids Apr. 25. CD 4/5.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 23 Kansas — May 24, Missouri, North Dakota
May 24, 25 Texas
STREETS AND ROADS
May 23 Kansas — May 24, Missouri, North Dakota
May 24, 25 Texas

▲† **Arkansas and Tennessee**—BA 6/11—U. S. Eng., P. O. Box 97, Memphis 1, Tenn., constr. 4 county bridges, Madison to Marianna Levee and Floodway, Arkansas, located along Madison to Marianna floodway channel St. Francis River, St. Francis and Lee Counties, in Arkansas opposite Memphis, Tenn., about 1¼ mi. below west end of Memphis and Arkansas Bridge, CIVENG-40-041-57-190; adv. E N R 5/16.

▲† **Texas**—BA 6/18—U. S. Eng., P. O. Box 5013, Galveston Dist., Ellington Air Force Base, rectification and imprvs. to Brays Bayou Old Main to South Main and Stella Link Road to Chimney Rock Road, near Houston, ENG-41-243-57-73. $1,000,000-$3,000,000.

† **N. M., Los Alamos**—TIE LINES—BA 6/20—Atomic Energy Comn., Chief Contracts Section, Los Alamos, 115 kv tie-line, Los Alamos to Santa Fe. Inv. No. 191-57-10, $825,000-$850,000.

HEAVY CONSTRUCTION—LB & CA

▲† **English Electric Export & Trading Co.**, Little Rock, Ark., CA **$1,389,825**, hydraulic turbines for Table Rock Dam Proj., near Branson, MISSOURI, U. S. Eng., P. O. Box 867, Little Rock, Ark. Bids Apr. 16. CD 4/25, under LB.

▲ **NORTH DAKOTA**—State Hy. Dpt., Bismarck,
N. D.—**W. H. Noel Co.**, Jamestown, N. D., CA **$539,658** base, b. conc. surf. F-319 (1) and F-111 (3) Towner and Cavalier Counties;
N. D.—**The Haggart Constr. Co.**, 403 First Natl. Bank Bldg., Fargo, N. D., CA **$535,368** b. conc. 21.618 mi. F-670 (3), Benson and Ramsay Counties;
N. D.—**Wm. Collins & Sons, Inc.**, 606 Black Bldg., **Schultz & Lindsay Constr. Co.**, 320½ Broadway and **Tennefos Constr. Co.**, 62½ Broadway, all Fargo, N. D. CA **$716,119**, grading, etc. 6.469 mi. I-01-8 (5), Barnest Co.;
N. D.—**Schultz & Lindsay Constr. Co.**, 320½ Broadway, Fargo, N. D., CA **$1,741,870**, c. conc. and bit. shoulders 14.095 mi. I-02-3 (1), Walsh Co. Bids Apr. 26. Grand total $3,533,015. CD 5/3, under LB.

† **Weitz Co.**, 406 Fleming Bldg., Des Moines, Iowa, LB Sch. 1 **$785,864**; LB Sch. 2 **$702,214**; LB Sch. 3 **$702,214**; LB Sch. 4 **$618,564**; nike facilities, Stage I West site, Ellsworth Air Force Base, ENG-25-066-57-66, RAPID CITY, S. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 1. CD 4/9.

▲ **Foutz & Bursum Constr. Co.**, c/o owner, CA **$1,880,000**. 47 mi. 30 in. gas lines, Lindrith to Chaco, NEW MEXICO. El Paso Natural Gas Co., Bassett Tower, El Paso, Tex. CD 12/5.

BUILDINGS—LB & CA

Hathman Constr. Co., Hatham Bldg., Columbia, Mo., LB **$894,000**, est. $800,000. Hichman HIGH SCHOOL addn. and remodel, COLUMBIA, MO. Bd. Educ., James E. Saunders, secy., Rangeline Rd., Columbia, Mo. Bids Apr. 30 CD 4/25

Eldridge Constr. Co., 3206 Strong Ave., Kansas City, Mo., LB **$903,948** (9 bidders) JUNIOR HIGH SCHOOL, MERRIAM, KAN. Rural High School Dist. 6, Johnson Co. (Shaenee-Mission School Dist.) Dr. Howard D. McEachen, supt. Schools, 7401 Johnson Dr., Merriam, Kan. Bids Apr. 30. CD 4/1.

Houston Smith Constr. Co., 109 S. Grandview St., Odessa, Tex., Owner Builds. **$750,000**. 5 story PETROLEUM BLDG., ODESSA, TEX. CD 11/9.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
June 4 Utah

▲† **California**—BA 5/28—U. S. Eng., 1209 8th St., Sacramento, constr. 17 mi. toe drain channel in Yolo Bypass in connection with construction of Sacramento Deep Water Channel, ENG-57-104. $1,500,000. CD 10/13/55.

▲† **Calif., Sacramento**—SAC INDUSTRIAL AREA—BA 5/29—U. S. Eng., 1209 8th St., constr. SAC industrial area, Mather Air Force Base, incl. fire station, squadron operations bldg., field maintenance bldg.,

armament and electronic shop bldg., parachute and dinghy shop, warehouse, exterior utilities, drainage, roads, sidewalks, parking, seeding and fencing, ENG-04-167-57-58. $1,400,000. CD 11/16.

BUILDINGS—BA

▲ **Calif., Mill Valley**—SCHOOL—BA 5/29—Tamalpais Union High School Dist., high school. $2,300,000. CD 11/12.

▲ **Calif., Bakersfield**—JAIL—BA 6/4—Kern Co., c/o clerk, Courthouse, 4 story, bsmnt. 87,000 sq. ft. jail, incl. sheriffs facilities $2,500,000. Wright, Metcalf & Parsons, 2323 E. St., archts. CD 11/29.

HEAVY CONSTRUCTION—LB & CA

▲ **Anderson & Westfall,** 3427 N.E. Halsey St., Portland, Ore., CA **$1,200,000,** dog racing track, FAIRVIEW, ORE. Multnomah Kennel Club, Fairview, Ore. Sundeleaf & Hagestad, Portland Trust Bldg., Portland, archts. Awarded May 2.

▲† **Marshall & Haas,** P. O. Box 95, Belmont, Calif., LB **$1,186,826,** est. $1,179,446 (3 bidders) earthwork, concrete canal lining and structures for 8.5 mi. section of Putah South Canal, Solano Project, DC 4881, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Winters, Calif. Bids May 8. CD 3/28.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N St., Sacramento,
McCammon-Wunderlich Co. & Wunderlich Contg. Co., 2555 Pulga Rd., Palo Alto, Calif., CA **$1,291,659,** grading, surfacing 2.2 mi. divided hy. and constr. 1 bridge and 1 equestrian crossing on Sign Rte 5 and Sign Rte 1 between Manor Dr. at Edgemar and Sign Rte 5 in San Mateo Co., Bids Apr. 24, awarded May 6. CD 4/26, under LB.

▲ **CALIFORNIA**—State Div. Hy., 1120 N. St., Sacramento, Bids opened May 8,
Fredrickson Bros., 1259 65th St., Emeryville, Calif., LB **$1,008,121** (4 bidders) relocating 6.7 mi. Sign Rte 12 east of Suisun, incl. 2 rein.-con. bridges and 1 rein.-con. culvert between 2.5 mi. east of Suisun and 0.5 mi. east of Denverton, Solano Co. CD 4/12.

▲ **Stolte, Inc., Contractors,** San Leandro St., Oakland, Calif., LB **$2,067,682** (9 bidders) constr. 12 m.g.d. sewage treatment plant and outfall line, primary and secondary treatment, RICHMOND, CALIF. City Council, City Hall, Richmond, Calif. Clyde C. Kennedy, 604 Mission St., San Francisco, Calif., consult. engr. CD 12/14.

▲† **Parish Bros. & Harms Bros.,** P. O. Box 6, Benicia, Calif., LB **$3,003,618** (Schedule B, use of asphalt), est. $3,170,678 (5 bidders) LB **$2,941,034** (Schedule A, use of portland cement) est. $3,235,327 (5 bidders) constr. runway parallel and facilities at Travis Air Force Base, near Fairfield, ENG-04-167-57-49, TRAVIS AIR FORCE BASE, CALIF. U. S. Eng., 1209 8th St., Sacramento, Calif. Bids Apr. 26. CD 4/4.

▲ **Williams & Burrows,** 500 Harbor Blvd., Belmont, Calif., CA **$1,448,770;** sewage treatment plant enlargement, WALNUT CREEK, CALIF. Central Contra Costa Sanitary Dist., 1250 Spring Brook Rd., Walnut Creek. CD 4/23, under LB.

BUILDINGS—LB & CA

▲ **Granite School Dist.,** 3212 S. State St., Salt Lake City, Utah, cancelled bids to have been opened May 21, JUNIOR HIGH SCHOOL, SALT LAKE CITY, UTAH. CD 4/17.

▲ **Clarence Ward Constr. Co.,** 4623 E. Harvey Ave., Fresno, Calif., LB **$1,318,452** (4 bidders) Selma Union HIGH SCHOOL addn., SELMA, CALIF. Selma Union High School Dist., c/o Supt., 2446 N. McCall Ave., Selma, Calif. Bids May 2. CD 4/23.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 22 Ontario

BUILDINGS—BA

▲ **Alta., Edmonton**—WAREHOUSE, etc.—BA 5/22—City, Civic Block, 1 story, part bsmnt., steel, rein.-con., masonry, warehouse and garage bldg. $1,500,000. Bell & McCulloch, 9946 106 St., archts. CD 11/12.

HEAVY CONSTRUCTION—LB & CA

S. D. Miller & Sons, 6999 Cote Des Neiges Rd., Montreal, Que. LB **$923,445.** regulating works and roadway underpass St. Lamber Lock, Lachine Section of St. Lawrence Seaway, QUEBEC. St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont. CD 4/15.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—LB & CA

▲† **Hawaiian Dredging & Constr. Co., Ltd.,** 1350 Ala Moana, Honolulu, Hawaii, CA **$3,485,000.** addnl. aviation facilities, hangar and aircraft parking area, U. S. Naval Air Station, NBy 8007, BARBER'S POINT, T. H. Dist. P. Wks. Office, 14th Naval Dist., P. Wks. Office, Pearl Harbor, T. H. Bids Mar. 22. CD 4/1, under LB.

(Proposal Advertisement see pp. 180 to 182)

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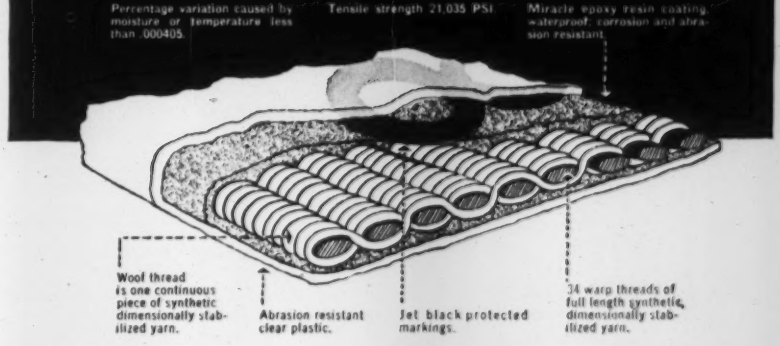
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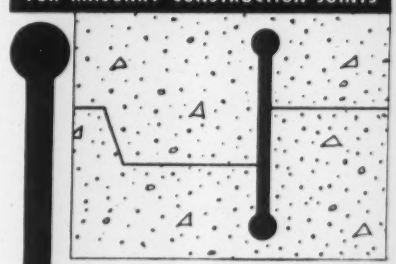

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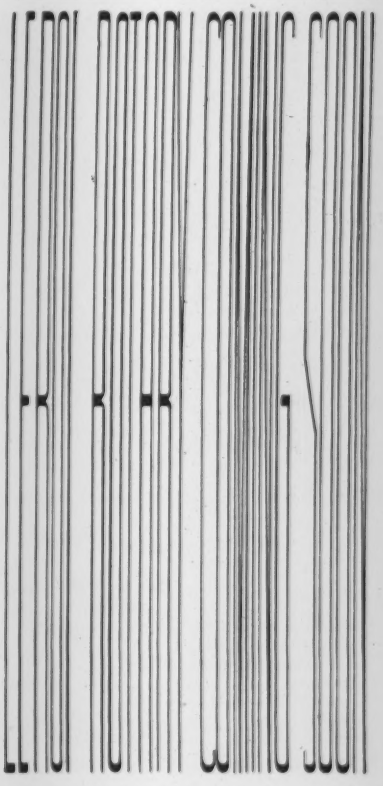

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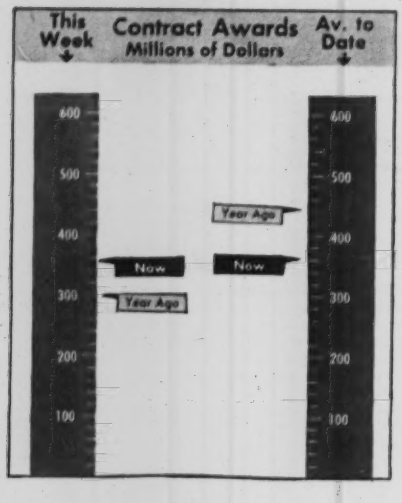
Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 20 wks 1957	Chge %
	millions		
Federal	$66.2	$1,160.8	+63
State and Municipal	168.0	2,697.7	+12
Total Public	234.2	3,858.5	+24
Total Private	123.5	3,387.8	−41
U. S. Total	$357.7	$7,246.3	−18
By Type of Work			
Waterworks	$52.9	$172.5	+51
Sewerage	13.3	168.2	−30
Bridges	4.4	267.3	+21
Highways	48.1	1,100.7	+25
Earthwork, Waterways	28.5	509.8	+86
Buildings:			
Public, Excl. Housg.	48.5	853.3	+11
Public Housing	19.4	285.7	+95
Private Housing	47.2	1,151.1	−53
Commercial	21.6	688.5	−8
Industrial	49.4	1,343.1	−41
Unclassified	24.4	706.1	−6
U. S. Total	$357.7	$7,246.3	−18

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

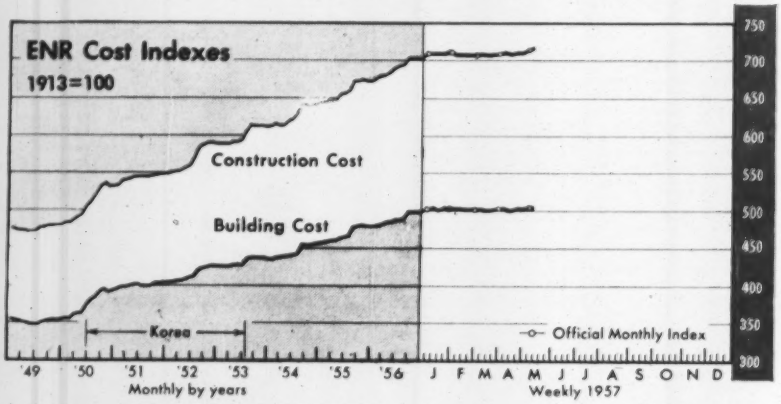
NEW CAPITAL FOR CONSTRUCTION

	Week of May 9	Cum. 19 wks 1957	Chge '56-'57 %
	millions		
Corporate Securities	$26.1	$2,264.2	+48
State and Municipal:			
All Except Housing	98.9	2,111.2	+25
Housing	...	41.5	+104
Federal Loans	0.9	81.4	+101
Federal Aid	250.0	250.0	...
Total Nonfederal	$375.9	$4,748.3	+45
Federal Appropriations:			
In U. S.	$0.9	$0.9	−97
Outside U. S.	...	.....	...
Total New Capital	$376.8	$4,749.2	+43

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of May 9 1957	% Change from April 11 1957	% Change from May 10 1956
Construction Cost	718.62	+1.2	+4.3
Building Cost	503.14	+0.4	+3.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518



CONTRACTS AWARDED

	1957 April (millions)	1957 4-Mos. (millions)	% Change from 1956 Mar.	% Change from 1956 4-Mos.
Total U. S., ENR reported	$1,460.1	$6,027.4	−0.5	−21
Private	731.8	2,879.2	+20	−43
Public	728.3	3,148.3	−15	+21
State and Municipal	543.7	2,253.1	− 4	+11
Federal	184.6	895.2	−36	+55
ENR Volume Index, 1913 = 100	564	542	+ 2	−26

NEW CONSTRUCTION CAPITAL

Total U. S.	$1,090.8	$4,183.0	+53	+55
State and Municipal Bond Sales	500.2	1,939.7	+84	+30
Corporate Security Sales	565.6	2,181.4	+32	+91
Federal Loans, Aid (nonfederal work)	25.0	61.9	+110	+68
Federal Appropriations (federal work)	.....	.....	.....	−100

MATERIALS SHIPMENTS

	Unit	1957 Jan. (J) Feb. (F) Mar. (M)	Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur Mines	thous bbls	11,805(J)	11,805(1)	−11	−11
Concrete Paving Awards, PCA	thous sq yd	9,582(M)	23,974(3)	+15	+ 2
Fabricated Structural Steel	thous tons	305(M)	846(3)	− 1	+0.2
Bookings, AISC	thous tons	289(M)	853(3)	−21	−23
Reinforcing Bars, Net, AISI	thous tons	235(F)	459(2)	+35	+29
Lumber, NLMA	mil fbm	2,486(F)	5,111(2)	−16	−13
Orders	mil fbm	2,567(F)	5,209(2)	−14	−15
Production	mil fbm	2,616(F)	5,332(2)	−10	− 9
Douglas Fir Plywood, DFPA, 3/8" basis					
Production (aver per week)	mil sq ft	96.2(M)	97.4(3)	−10	− 7
Orders (average per week)	mil sq ft	111.5(M)	96.3(3)	+14	− 1
Clay Products, Bureau of Census					
Brick, Unglazed, Common, Face	mil bri	314.0(J)	314.0(1)	−28	−28
Vitrified Clay Sewer Pipe	thous tons	107.9(J)	107.9(1)	−11	−11
Structural Tile, Unglazed	thous tons	46.5(J)	46.5(1)	−14	−14
Asphalt Products, Bureau of Census					
Asphalt Roofing	thous sales sqs	4,142(F)	8,037(2)	−10	+ 3
Asphalt Siding	thous sales sqs	91(F)	194(2)	−19	−0.5
Aluminum, Wrought, Net, Bur Census					
Sheet and Plate (non-heat treatable)	mil lbs	71.7(F)	153.3(2)	−22	−19
Wire and Cable	mil lbs	21.4(F)	48.5(2)	−13	−0.1
Extruded Shapes (soft alloys)	mil lbs	43.4(F)	92.2(2)	−16	−11

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS	thous	2,796(M)	2,746(3)**	+ 5	+ 5
Contractor Failures, Dun & Bradstreet					
Number		205(M)	562(3)	+37	+35
Liabilities	thous	$10,424(M)	$29,536(3)	+47	+28

** Average per month

PRIMARY PLANTS: Use with Intermediate and Secondary Plants or alone for producing ballast. Jaw crushers 1524 to 3042 in size. Choice of portable apron or built-in feeder. Some have scalping screen ahead of crusher.

IN-LINE GRAVEL PLANT: Extra large capacity with low weight. Meets most highway load limits. Has 1036 jaw crusher, 30" x 24" rolls, 4' x 12' — 2½ deck vibrating screen . . . yet weighs only 55,900 lbs. on the road!

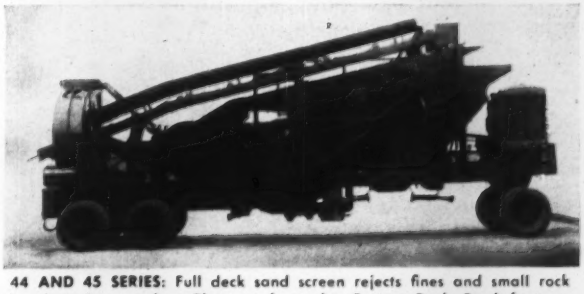
INTERMEDIATE PLANTS: Used with Primary and Secondary Plants to increase flexibility of operation and boost output. Meets highway height, width, and weight limits. Models offer choice of either jaw or roll crusher.

SECONDARY PLANTS: 4 models of Secondary Plants offer choice of 3018, 4022, and 5424 twin roll crushers or 4022 triple roll crusher with 3' x 10', 4' x 10', or 4' x 12' — 3½ deck vibrating screens.

For men who like to underbid their competitors . . . (and make a nice profit, too)

Pioneer Portable Crushing Plants

BOTTOM DECK FEED PLANTS: Exclusive method of routing material through plant gives *twice* the effective screening area of conventional plants, also lets operator equalize load between jaw and roll crusher while plant is operating. These and other features, give extra capacity and unusual control of gradation. Four models.



44 AND 45 SERIES: Full deck sand screen rejects fines and small rock bypasses jaw crusher. These and regular Bottom Deck Feed features give extra big capacity. 4 full screen decks and spouting arrangement can produce 4 sizes of material at same time. Electric or mechanical drives.

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☐ BITUMINOUS PAVERS	☐ APRON FEEDERS	☐ CONVEYORS

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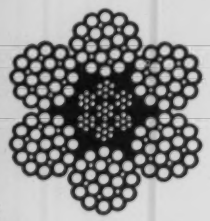
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LOOK FOR THE YELLOW TRIANGLE

5078

Congress Wraps Up Housing Package

Politics guarantees that Congress will pass—and President Eisenhower will sign—a big housing bill this year, one that gives new and expanded benefits to a wide variety of programs.

But as the legislation passed by the House shows, aid to housing will mainly be devoted to giving additional government support to private lenders and private builders. There isn't likely to be enough of a direct injection of government money to make an appreciable difference to the housing market.

Basically, a rise in housing starts depends upon an easing of the money supply, and the Administration's policy is to stick with "hard money" and its emphasis on holding down any measures that would lead to inflation.

The powerful lobbying blocs that have backed legislation before have lost much of their power. The housing lobby is hard put to answer arguments that total construction spending is reaching new all-time highs. Hence, the Administration has its way with the argument that housing starts aren't needed to keep the economy prosperous. The veterans' bloc is no longer powerful enough to get all it wants. Those favoring easier credit have had little success so far in convincing a majority of Congress that tight money has re-

—House Slashes Down Payments on FHA Loans—

Mortgage Money

Present Law: FNMA's $1.6 billion for buying government backed mortgages will soon be committed.

House Bill: Gives FNMA authority to invest an additional $1.25 billion in mortgages. Treasury would supply 9% of the money. Balance would be raised from sale of debentures to private investors.

Outlook: Senate almost certain to go along with this big stimulus to secondary mortgage market.

Down Payments

Present Law: Minimum FHA down payment now runs 5% of first $9,000 of appraised value of the property, up to 16% on a $20,000 house. This amounts to $700 on a $10,000 house, $3,200 on $20,000 and $5,000 on a $25,000 house.

House Bill: Drops minimum down payment to 3% on first $10,000 of value, 15% on next $6,000, 30% on value over $16,000. This would be $300 on a $10,000 house, $2,400 on a $20,000 house, $5,000 on a $25,000 house.

Outlook: Chances are excellent for Senate adoption of down payments as low as those in the House bill—or even lower. Reason: Congressmen feel that with GI benefits expiring, they must enact legislation that will allow them to answer criticism charging them with being anti-veteran. Approving lower down payments across the board does something both for housing—a powerful lobbying bloc—and for the veterans, another powerful lobbying bloc.

Veterans

Present Law: VA now underwrites homes with down payments as low as 2%—$200 on a $20,000 house, 4½% interest. VA will also make some direct loans when private lenders won't lend at interest rates specified. VA housing starts have declined to a fraction of what they were a year ago.

House Bill: No provision is made for new housing privileges for either the World War II or Korean veteran. House killed efforts to write in provisions giving the veterans a special housing status.

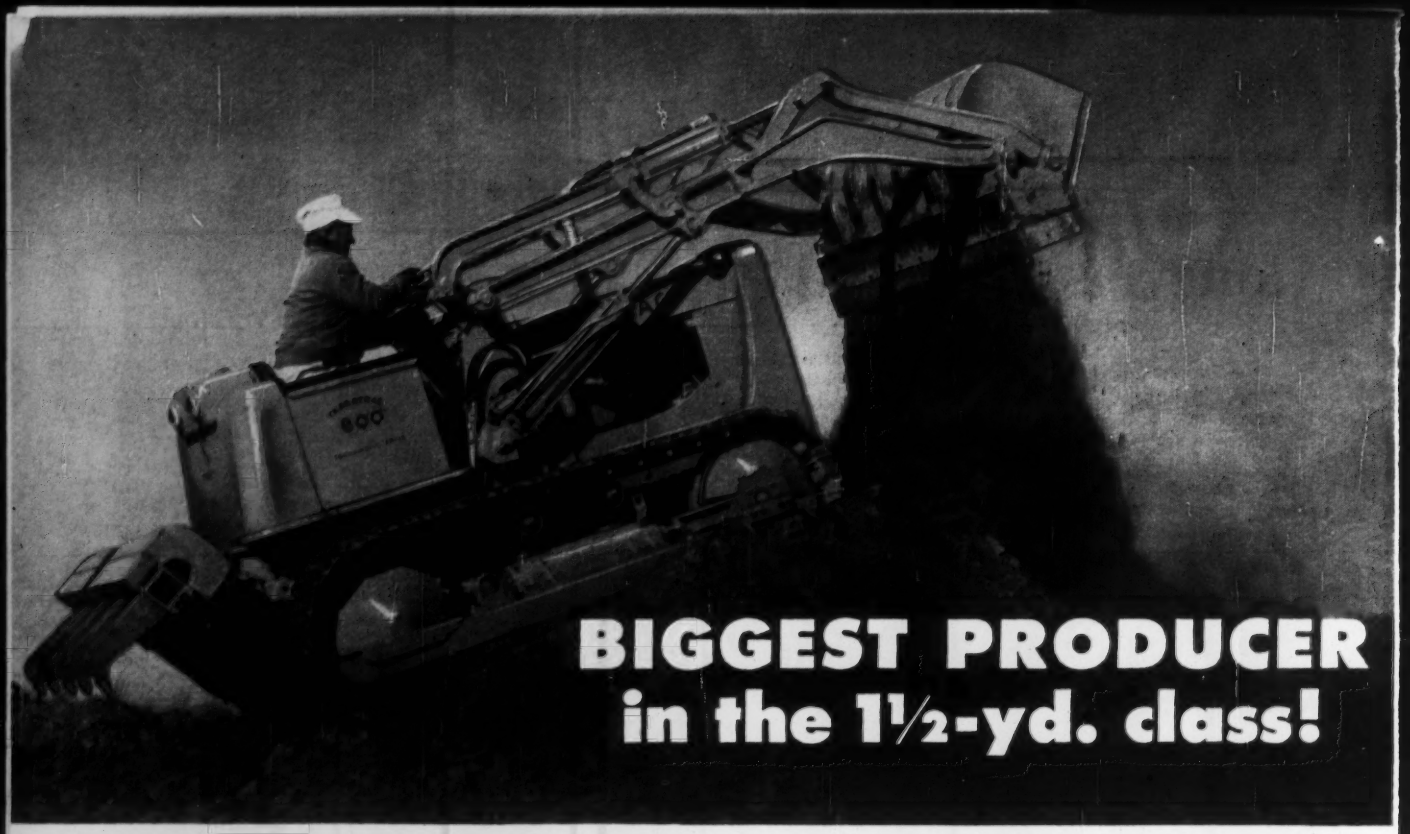
Outlook: No special legislation for veterans housing will be written this year; market will be controlled by provisions of existing GI law, which means that housing gets no special stimulus through veterans' legislation.

Urban Renewal

Present Law: Program in 1949 law for encouraging private developers to redevelop cleared slum areas has produced several hundred projects. Most of the $500 million in grants to city redevelopment authorities has been committed.

House Bill: Would give Urban Renewal Administration $250 million in additional funds to be used for federal grants. This pays one-third of the cost of buying the land, clearing the slums, and selling or leasing the property.

Outlook: The $250 million is sure to be approved. Final law will probably not change language requiring a city to have a "workable program" in order to qualify for grants.



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New 80 HP tractor-shovel moves up to 40% more yardage per shift!

Most spectacular feature of this new higher-speed 1½-cu. yd. Case-TerraTrac Model 800 crawler is a revolutionary COUNTER-ROTATING Terramatic transmission, that *drives one track forward and the other in reverse — SIMULTANEOUSLY*. Result: Tractor can make fast 360° spin-turns within a track radius of only 5'7" — and still maintain power and traction on both tracks, for moving big loads in mud, or rough terrain.

Instant power-shift, plus constant-mesh gear-train lets operator *change speeds and direction "on-the-go"* — without touching a master clutch, or stopping to shift gears. These exclusive features — combined with *torque-converter drive*, and a new torsion-bar system of track oscillation — give this 80 HP Case-TerraTrac shovel far more power, speed, *and ease of maneuverability* than any other crawler in its price range. New automatic track-roller lubrication cuts greasing time from once a day to several times a year. Call your Case Industrial Dealer now for a free demonstration, or —

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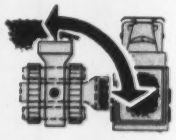
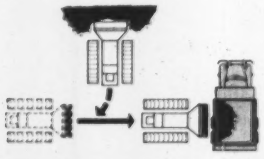


With Case-TerraTrac 800 . . . Operator picks up load smoothly . . . flips two hydraulic levers and steps on foot throttle, to spin tractor over a center point into position for dumping, with *one 90° counter-rotating turn*. Then he simply reverses two levers and makes one NON-STOP 90° turn back to pile in seconds. Result: Each cycle is completed with minimum lost time, minimum travel distance, and minimum operator fatigue.



With conventional crawler-loader . . . Operator rams into pile . . . de-clutches . . . hand shifts into reverse . . . uses hand throttle and brake, to turn and back away. Then he has to de-clutch . . . stop . . . hand-shift and move forward again to dump. What's more, he has to go through the same complicated procedure *in reverse*, to pick up his next load. Result: He usually travels twice as far . . . takes more time to complete each cycle . . . gets twice as tired before end of day . . . just working his hands and feet.

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CT-L-32

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sulted in harm either to business or the consumer.

Congress is going to pass an omnibus housing bill that will be designed to draw more private money into the mortgage market, and ease some of the federal controls on down payments, and the like. But the general prosperity and the popularity of budget cutting has meant that any sizable program of direct federal spending or lending to boost homebuilding will not succeed.

One sign of the times is the refusal of the House to go along with proposals to commit GI insurance reserves to the purchase of special FHA mortgages for veterans. The idea was to put, say, $1 billion of these reserves into government-insured mortgages on housing for veterans.

House Banking Committee leaders quickly saw this couldn't be passed, primarily because the Veterans Affairs Committee was dead set against creation of a new veterans preference program. Instead, they went along with an increase in the borrowing authority of Fannie Mae of $1.25 billion, to be invested in both FHA and VA mortgages. More and more the Veterans Committee has been reporting that the ex-GI sees himself less as a veteran, and more as just another citizen.

At the same time, the Democrats are pushing housing legislation far beyond what the Administration would prefer. Democrats think they have a political issue in keeping their record as a party that's favorable to both private and public housing. However, the measure that's sent to the President before Congress goes home will not be so extreme as to invite a veto.

The new law, when it's passed, should help somewhat in keeping housing starts from going any lower, but the real boost to housing depends on an increase in the supply of money. This subject will get extended publicity from the Senate finance hearing which has been given the job by the Democratic leaders of holding hearings to make political issues out of high interest rates and tight credit.

Tax Aids Questioned

Treasury Secretary cites U.S. revenue loses

With the obvious blessing of President Eisenhower, Treasury Secretary Humphrey last week voiced his support of a bill now before Congress to limit rapid tax amortization privileges only to defense industries and certain research programs for the Atomic Energy Commission. He claimed the program has cost the federal government $3 billion.

The once-potent incentive that led to widespread expansion programs in defense and defense-related industries is on its way out after seven years.

The fast tax write-off program was launched in 1950 when government officials felt that private industry should substantially boost production capacity to meet the combined needs of the Korean War and the civilian requirements of a nation still trying to catch up with some demands postponed during World War II.

Only a handful of industries still are eligible for the certificates which at one time gave tax help to some 229 industries, notably such large construction spenders as steel, aluminum and electric utilities.

In essence, the program was simple—a goal was set for increased capacity in a specific industry. A company in that industry then applied for fast tax amortization on a new project. The government then determined what percentage of the project represented defense expansion. In a typical case, the percentage might be 75% or 80% of the total cost. This percentage could be amortized for tax purposes over a five year period. The remaining 20% to 25% would be amortized over the usual life, probably 20 to 25 years.

The scheme enabled industry to cut its tax bill during the initial five year period that a plant was built. (Over the full life of the building, however, the amount amortized would be the same as it would have been without fast tax write-offs.) Secretary Humphrey's estimate that the program cost the U. S. $3 billion is based on the idea that since corporate taxes were reduced appreciably, the federal government had to borrow money publicly to supplant the funds that were not collected from industry. The interest on this borrowing totaled about $3 billion.

First Quarter Machinery Orders Steady

Construction contractors have been buying new excavating and earthmoving machines at a fairly steady pace thus far in 1957, second only to 1951's record in dollar volume.

Although March brought the second consecutive monthly dip in the New Orders Index computed by the McGraw-Hill Department of Economics, orders showed little month-to-month change in the first quarter.

From a high of 267 in January, the index declined to 258 in February and then edged down to 256 in March (based on 1949 = 100). First quarter orders were 3% above last year.

March is the first month this year to fall below the year ago rate. But, there is a strong possibility that April machinery orders will show a similar downturn when the figures are compiled.

Contractors may reduce the volume of their orders for new machines because their volume of new heavy construction business has been running well behind last year. The chart shows how the contract award trend has dropped under the machinery orders trend thus far in 1957. The orders index probably will fall, too, closing some of the gap.

However, a decline in new orders for machinery probably would not last more than two or three months. That's because the contract trend is upward. Private construction contracts, which had been in a bad slump, now are showing some improvement. The upturn in private work, plus a continuing boom in public works, should keep machinery orders at a high level and certainly would forestall any serious decline in such orders.

Awards Show Tollroads Reaching End of the Line

Graphic evidence of the near-end of tollroad construction is contained in the accompanying table, part of ENR's annual survey of highway construction plans (ENR May 2, p. 26).

With the end of the construction period, however, has come a heavy—and expected—shift into the maintenance phase for the tollroads, with only increases in expenditures reported in this category, and in the purchase of equipment for maintenance work.

Reason for the total 50% drop in contracts let is, of course, that only one major tollroad still has substantial construction ahead of it—the Illinois Turnpike—and that only one other—New York's Thruway—still has substantial construction work to do on various spurs and connecting routes.

It is worthy of note, also that out of 28 tollroads either built or authorized by state legislatures, nine are completely dormant due to lack of financing, doubts about feasibility or lack of completed studies. Some of these could be revived later.

Tollroad Construction Programs, 1957

Reported to Engineering News-Record by Tollroad authorities and state highway departments, in thousands of dollars

Agency	Contracts			Maintenance						Total Contracts and Maintenance		
				By Own Forces			By Contracts					
Toll Authorities	Scheduled 1957	Let 1956	Percent Change	1957	1956	Percent Change	1957	1956	Percent Change	1957	1956	Percent Change
Alabama Turnpike Authority	a	$1,752b	−100	.....	.....	.....	.....	.....	.....	a	$1,752b	−100
Florida State Turnpike Authority	c	8,815b	−100	.....	.....	.....	.....	.....	.....	c	8,815b	−100
Illinois State Toll Highway Commission	$100,000	24,959	+301	.....	.....	.....	.....	.....	.....	$100,000	24,959	+301
Indiana Toll Road Commission	None	None	.....	$1,191	$117d	+918	None	None	.....	$1,191	$117d	+918
Iowa Toll Road Authority	n.a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas Turnpike Authority	.....	7,137	−100	400	75	+433	.....	.....	.....	400	7,212	− 94
South Louisiana Turnpike Commission	n.a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maine Turnpike Authority	None	None	.....	475	529	− 10	.....	.....	.....	475	529	− 10
Massachusetts Turnpike Authority	n.a.	6,081b	.....	.....	.....	.....	.....	.....	.....	n.a.	6,081b	.....
Michigan Turnpike Authority	e	2,128b	−100	.....	.....	.....	.....	.....	.....	e	2,128b	−100
New Jersey Turnpike Authority	Not Known	3,000	.....	1,800	1,800	0	Nominal	Nominal	.....	1,800	4,800	− 62
New Jersey Highway Authority	2,000	12,000	− 83	1,200	1,050	+ 14	90	60	+ 50	3,290	13,110	− 75
New York State Thruway Authority	101,000	122,370	− 17	3,400	3,342	+ 2	.....	.....	.....	104,400	125,712	− 17
Ohio Turnpike Commission	None	None	.....	1,420	1,359	+ 4	.....	.....	.....	1,420	1,359	+ 4
Oklahoma Turnpike Authority	f	10,936	−100	210	140	+ 50	None	76	−100	210	11,152	− 98
Pennsylvania Turnpike Commission	None	5,100	−100	3,100	2,620	+ 18	2,822	2,818	+0.1	5,922	10,538	− 44
Rhode Island Turnpike and Bridge Authority	g	.....	.....	.....	.....	.....	.....	.....	.....	g	.....	.....
Texas Turnpike Authority	300	28,000	− 99	200	None	.....	.....	.....	.....	500	28,000	− 98
Richmond-Petersburg Turnpike Authority (Va.)	20	27	− 26	None	None	.....	None	None	.....	20	27	− 26
Old Dominion Turnpike Authority (Va.)	g	.....	.....	.....	.....	.....	.....	.....	.....	g	.....	.....
Carolina-Virginia Coastal Turnpike Authority	i	i	.....	.....	.....	.....	.....	.....	.....	i	i	.....
Washington Toll Bridge Authority	6,595j	10,053	− 34	.....	.....	.....	.....	.....	.....	6,595j	10,053	− 34
West Virginia Turnpike Commission	None	None	.....	303	275	+ 10	50	170	− 71	353	445	− 21
Total — Toll Authorities	**$209,915**	**$242,358**	**− 13**	**$13,699**	**$11,307**	**+21**	**$2,962**	**$3,124**	**− 5**	**$226,576**	**$256,789**	**− 12**
State Highway Departments with Tollroads												
Colorado	None	None	.....	16	12	+ 33	None	4	−100	16	16	0
Connecticut	6,000	168,000	− 96	k	k	.....	k	k	.....	6,000	168,000	− 96
Kentucky	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	None	6,470b	−100	None	None	.....	None	None	.....	None	6,470b	−100
New Hampshire	750	15,460	− 95	.....	.....	.....	.....	.....	.....	750	15,460	− 95
Total — States	**$6,750**	**$189,930**	**− 96**	**$16**	**$12**	**+ 33**	**....**	**$4**	**−100**	**$6,766**	**$189,946**	**− 96**
GRAND TOTAL	**$216,665**	**$432,288**	**− 50**	**$13,715**	**$11,319**	**+ 21**	**$2,962**	**$3,128**	**− 5**	**$233,342**	**$446,735**	**− 48**

AGENCY	New Equipment Purchases		
Toll Authorities	1957	1956	Per Cent Change
Kansas Turnpike Authority	.....	$830	−100
Maine Turnpike Authority	$50	220	−77
New Jersey Turnpike Authority	Nominal	Nominal	.....
New Jersey Highway Authority	175	25	+600
New York State Thruway Authority	230	442	−48
Ohio Turnpike Commission	109	275	−60
Oklahoma Turnpike Authority	250	8	+3,025
Pennsylvania Turnpike Commission	330	243	+36
Texas Turnpike Authority	150	None	.....
West Virginia Turnpike Commission	20	10	+100
Total — Toll Authorities	**$1,314**	**$2,053**	**−36**
State Highway Departments with Tollroads			
Colorado	3	6	−50
Connecticut	2,200	None	.....
Total — States	**$2,203**	**6**	**+36,616**
GRAND TOTAL	**$3,517**	**$2,059**	**+71**

a Authority dormant due to negative report of traffic and survey engineers.

b Bureau of Public Roads report.

c $185 million bond issue postponed because of anticipated competition from proposed interstate road system.

d Aug. 15 Dec. 30.

e Authority operating on standby basis. No turnpike projects financed to date. Preliminary traffic and engineering studies completed for 113 mile turnpike from Rockwood to Saginaw.

f Two turnpikes under feasibility studies; no financing arranged.

g Still studying feasibility of project.

h Contractors purchase own equipment. Road completion scheduled for April '58.

i Project at standstill due to inability to sell bonds.

j Excludes three bridges valued at $44 million on which feasibility studies are being conducted.

k Maintenance costs not separated for toll and non-toll roads.

l Excludes listing of toll authorities and states reporting no equipment purchases in either '57 or '56.

n.a. Not available.

INDUSTRIAL WHEEL AND CRAWLER TRACTORS • DOZERS • LOADERS • BACKHOES • ROAD MIXERS

Court Favors Sub

6,000 change orders on U.S. hospital job kill original contract

A contract dispute over additional compensation claimed by a subcontractor from a prime contractor on a federal construction project in Salt Lake City, Utah, finally came to an end in the U.S. Supreme Court.

The court refused to review a lower court ruling, awarding some $63,000 claimed by Reischel & Cottrell-Martin Bros., a joint venture of subcontractors, over the amount agreed upon for performing lathing and plastering services in the construction of a Veteran Administration hospital.

In effect, the Supreme Court's action affirms the award and denies the appeal of the joint venture group of prime contractors—headed by the Wunderlich Contracting Co.

The dispute arose after a whole series of substantial changes were made by the federal government in plans and specifications for the VA hospital after work had begun. Wunderlich contracted with the government to build a 500 bed hospital for $7.9 million. Reischel & Cottrell-Martin Bros. were successful bidders on all lathing and plastering work for $244,650.

More than 6,000 substantial changes were made after work began, forcing the subcontractors' costs up and increasing the time required for performance by 50%. Work on the hospital was completed in August 1952, a year after the scheduled competion time.

The Court of Appeals ruled that the "unprecedented and unreasonable" number of changes made by the government amounted to abandonment of the original subcontract. It permitted the subcontractor to recover a total of $63,483.76—the reasonable value of the services performed in excess of the contract price—from the prime contractor and the insurance companies who acted as surety on its Miller Act payment bonds.

In appealing to the Supreme Court, Wunderlich argued that since the subcontractor had agreed to be bound by the terms of the prime contract, which contained specific provisions for changes in specifications, and had signed various "change orders" during construction and had taken no steps to rescind the contract, the subcontractor had no right to sue for reasonable value of his additional services.

Wunderlich also argued its liability for the increased costs of the subcontractor was limited by the contract terms and could not be enlarged by the court.

The Supreme Court denial of this appeal does not necessarily mean the same result would be approved in another case. But the high court at least decided not to upset this phrase in the lower court's decision:

"A contractor who bids for work has the right to rely on the plans and specifications submitted to him for bidding purposes . . . burdens other than those contemplated by the contract may not be placed upon the contractor without additional compensation."

Mortgage Money

Unions boost investment in U.S. insured loans

Investment of union funds in government-insured mortgages for home construction got another boost last week when the International Ladies Garment Workers Union committed $10 million to the financing of one and two-family homes for Air Force personnel in Nevada.

Through the Manufacturers Trust Co. in New York, the ILGWU will place $10 million in housing bonds representing FHA construction loans for 645 new homes for officers and enlisted men at Stead Air Force Base. The union and the International Brotherhood of Electrical Workers previously have allocated $10 million each for similar investment at a Strategic Air Command base in Little Rock.

The housing is being constructed by the Air Force under the Armed Service Housing Act, which requires investment of private funds in FHA insured mortgages. According to ILGWU President David Dubinsky, housing financed by the $30 million available from the ladies garment and electrical workers unions will represent the first family housing constructed for the armed services without federal appropriation.

Both of the AFL-CIO unions have been pioneers in the use of union funds for housing purposes. Mr. Dubinsky, in announcing last week's commitment, said his union will now have $80 million—one-third of its reserves—in FHA and VA government-insured mortgages. Additional investments of the same type, he said, are planned. The IBEW, on both the local and national level, has shown a similar interest in housing during recent years. It was designated by the FHA as an "approved mortgagee" last December, when it announced its intention to invest $1 million a month in FHA mortgages.

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AFL-CIO Opens Teamster Hearing

Dave Beck's union officially charged with corruption as chasm widens between teamsters and the federation

The future of the teamsters union as a member of the AFL-CIO hung in the balance again last week as the AFL-CIO and the McClellan Select Committee took on the union and its president, Dave Beck, for more questioning.

Plagued now by a host of factors, including beer, prosperity and an apparent indifference to public censure, the teamsters had clearly reached the point of no return. And so had the AFL-CIO.

By the end of the week, the teamsters union stood accused of miscellaneous corruption by the AFL-CIO Ethical Practices Committee, which has been assigned the task of finding out whether the union is sufficiently dominated or controlled by corrupt influences to warrant suspension from the federation.

• **Charges**—The accusations, largely in the form of inferences and beliefs relating to offenses against trade union morality, were handed to the teamsters in an eight-count, 22 page report at the May 6 AFL-CIO hearing, which the teamsters' Executive Board attended not so much to participate in as to protect their "rights." The union was given 18 days in which to reply to what Mr. Beck referred to as "malicious and unfounded slander."

The AFL-CIO complaint against the teamsters contained three principal charges:

• Use of union funds by Mr. Beck for personal purposes.

• Use by Mr. Beck of his official union position for personal profit.

• Failure on the part of the union to clean its own house, including a failure to determine whether Mr. Beck's repeated use of the Fifth Amendment before the McClellan committee was a ruse to hide personal corruption.

Later in the week, the McClellan committee spread on the record additional testimony implicating Mr. Beck in the use of his teamster position to further the interests of his son as a beer distributor and to reap financial profits from mortgage investments.

• **Deadlock**—Net result appeared to be a grim determination on the part of the AFL-CIO to let the chips fall where they may.

Addressing a union convention in New York on Tuesday, AFL-CIO President George Meany pulled no punches. "We are going to come to our decision," he said, "by trade union morals and ethics. Those charged with responsibility have no idea of walking away from their mandate of keeping the trade union movement at its high ethical standards. Somewhere along the line, a union may have to be dissociated from the family of labor."

Teamster officials, who said the AFL-CIO hearing "smacks of a medieval inquisition and witch hunt," stood just as firm. Their primary concern, said Mr. Beck, is the "welfare of the membership—the efforts to obtain improved wages, shorter hours and better working conditions—and the preservation of our autonomy." The teamsters' Executive Board decision to protest the indirect and "illegal" AFL-CIO attempt to fumigate the union is based, Mr. Beck told teamsters, on the "sound principle of autonomy, a position from which it cannot retreat."

• **Caution**—Meanwhile, from in and out of the ranks of labor, electrical workers' President Gordon Freeman, writing editorially last week in his union's monthly journal, said: "We condemn with all our strength, dishonesty and racketeering wherever it exists in any labor union. . . . However, . . . we want to caution our union people not to follow the example of the general public and condemn labor leaders before they have been tried and found guilty. . . . We do not subscribe to the current trend that 'a man is guilty until he has been proved innocent'."

And deputy undersecretary of labor Millard Cass, speaking at Cornell University, warned that "unions are valuable social and economic institutions. . . . We must not condemn the 17,000,000 honest trade union members or weaken their basic right because a small percentage turn out to be hoodlums, crooks and racketeers."

Behind such words of caution lay two provocative developments:

• Vice President Richard Nixon last week named Senator Carl Curtis of Nebraska to the McClellan committee vacancy left by the death of Senator Joseph McCarthy. Sen. Curtis is generally regarded as a foe of organized labor.

• Select Committee Chairman Senator John McClellan made an abortive attempt to hamstring pending civil rights legislation by sponsoring a tacked-on right-to-work amendment that would have outlawed all union shop agreements. Said the AFL-CIO: "It jeopardizes the senator's reputation for fairness in the labor-management field. It lessens his stature as chairman of the labor-management investigating committee. It is a mistake—a very serious mistake."

Five Year Pact for Carpenters

California carpenters win 22½ cents now but use a reopener; three-year contracts, 15 cents, are common

The trend toward long-term labor contracts continued last week as 50,000 carpenters in 42 northern California counties led the pack with a new five year contract. Agreements of one year duration were lagging behind, and three year contracts were rapidly gaining in number.

The California carpenters, who originally asked the Northern and Central California Chapters of the Associated General Contractors for 37½ cents in wages and 20 cents in fringe benefits, settled for a 22½ cent wage boost this year and another 15 cents next year; the contract will be reopened in May 1959 on wages and working conditions. Fringe benefits won by the union include $3.00 a day subsistence pay, plus a pension plan payment that will commence in January 1959.

Other five year pacts recently concluded and previously reported include contracts with laborers in Philadelphia, Pa., and in northern California, and with cement finishers in Wilmington, Del. So far, they are about evenly split on use of wage reopeners as opposed to fixed and predetermined deferred increases.

• **Three year contracts**—No less significant, however, in the industry's search for stabilization of labor costs—and labor relations generally—is the growing use of three year contracts.

Out of 12 reported last week, there was a broad distribution both geo-

graphically and by trades. Annual wage increases ranged around 15 cents but little uniformity was apparent. Reopeners were used in only two of the contracts.

In this group, the largest of the settlements—52 cents— went to the carpenters in Miami, Fla. In its negotiations with the AGC and Home Builders Association, the union settled for the increase payable in five installments and obtained time and a half for overtime and double time for holidays, Sundays and Saturday afternoons.

Increases almost as large—50 cents—were obtained by teamsters, laborers and carpenters in settlements with the St. Louis, Mo. Home Builders Association. In each case, the increase is payable in four installments; 2½ cents of the laborer and carpenter increases will be applied to welfare.

Use of the reopeners occurred in Detroit, Mich., where operating engineers settled on 20 cents (15 basic and 5 vacation) and laborers on 18 cents (13 basic and 5 vacation) for this year. Contracts will be reopened in the second and third years.

Elsewhere, there was some similarity in bargaining results. Carpenters, cement masons, laborers, operating engineers and teamsters in Minnesota's Twin Cities, and painters in Rhode Island each wound up with a 45 cent increase—15 cents each year. (For Rhode Island painters, the residential rate is lower—10, 10 and 10 for a total of 30).

• **Others** — Settlements reflected in shorter-term contracts were numerous, and here again the 15 cent range was common.

In Ohio, the teamsters, who had crippled $158 million worth of highway projects by striking in 85 of the state's 88 counties, settled for 15 cents in a one-year contract; the Laborers District Council of Ohio agreed to 15½ cents in a one year contract with the Ohio Contractors Association; Youngstown carpenters won 30 cents (15 and 15) over a two year period; most of the Toledo crafts settled for 22 cents—17 now, 5 on Nov. 1—in one year contracts; and in Warren, electricians accepted 15½ cents, cement finishers 15 cents, and bricklayers 15½.

Detroit, Mich., bricklayers settled without a basic rate increase, but in a one year contract won a 5% boost in fringe benefits for new pension and holiday funds.

In Des Moines, Iowa, five of the trades settled for increases ranging from 10 to 15 cents an hour in one year contracts; the plumbers won 30 cents—17½ and 12½ in a two year contract.

Plumbers Sue Contractor To Obtain Job-Site Work

The issue of job-site versus shop fabrication has been raised by the plumbers union in a $1 million lawsuit filed by the international union in Philadelphia.

In a complaint before the Federal District Court, the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry has charged that United Engineers and Constructors, Inc., now building a Detroit Edison power house at River Rouge, Mich., has violated a collective bargaining agreement between UA and National Constructors Association by requiring that piping four inches and under be fabricated off the River Rouge job site.

The UA-NCA agreement calls for job-site fabrication of piping four inches and under. United Engineers is a member of NCA.

The UA, which seeks to have the agreement specifically enforced, is asking for an injunction and $1 million in damages. It contends that the action of United Engineers has caused UA a loss of jurisdiction and a loss of members and will destroy the job content enjoyed by plumbers and pipefitters under custom, usage and contract.

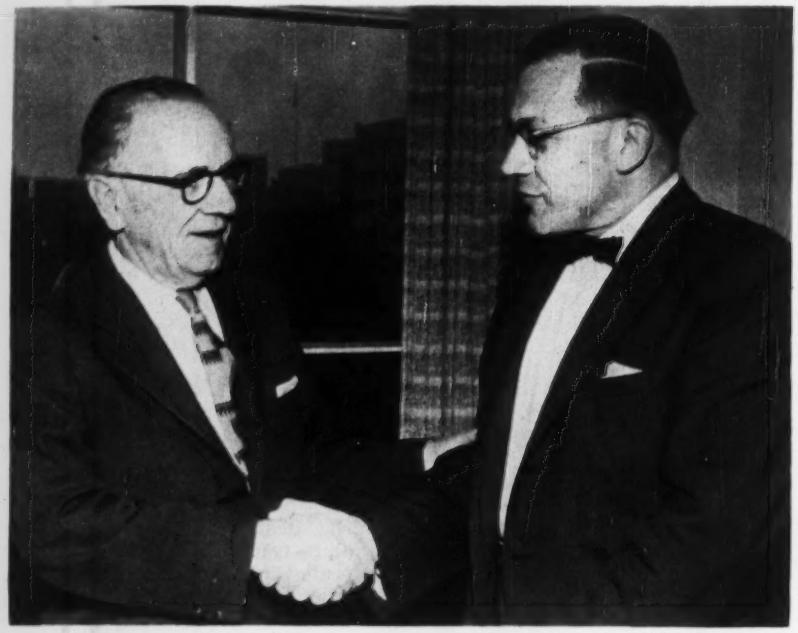
Labor Sees High Profits In Hawaiian Construction

Union spokesmen have accused contractors of making excessive profits on construction work in Hawaii.

The charges, denied by contractors, were made at a hearing before a House committee of the Hawaii Legislature.

AFL-CIO labor leaders said contractors were making a 30% profit on homes and that building materials are priced 100% above U. S. mainland levels in some cases. Noting that labor costs on the islands are 30% lower than on the West Coast, they asserted that building costs are "way out of line" even after an allowance is made for freight charges.

According to union spokesmen,



New Representative Named to Joint Board

Merrill R. Carr (left) of Baltimore, Md., has been named insulation contractor representative on the National Joint Board for the Settlement of Jurisdictional Disputes. Now under the chairmanship of Harvard Professor John T. Dunlop (right), the board is the construction industry's voluntary machinery for settling jurisdictional disputes within the building trades and represents both labor and management, including general contractors and subcontractors. Mr. Carr is president of H. W. Porter & Co., Inc., Newark, N. J., and of Reid Hayden, Inc. of Baltimore, Richmond and Charlotte. The Porter-Hayden insulation firms, which function as one organization, specialize in industrial and public utility installations.

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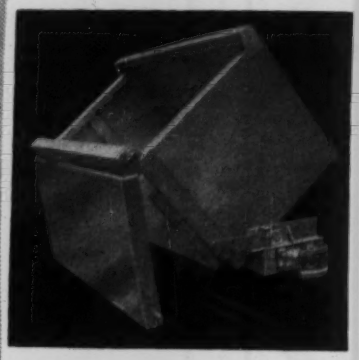

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FREE Bulletin No. 18 shows car details; No. 21 illustrates Automatic Coupler.

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Honolulu homes cost $10 to $12 a sq ft—nearly as much as in the United States where double walls and heating are included. But Gordon Scrution of the General Contractors Association claimed that Hawaiian homes have more built-in features.

Labor Asks Court to Kill Anti-Picketing Ordinance

A city ordinance that bans picketing on city streets and sidewalks has been attacked as unconstitutional by three groups in organized labor. The Kentucky State Federation of Labor, Local 1270 of the carpenters union and Local 70 of the International Brotherhood of Firemen and Oilers have asked the Madison Circuit Court to declare invalid a Berea, Ky., ordinance that subjects pickets using streets and sidewalks to fines of $10 to $100.

The unions contend that the ordinance violates both the state and federal constitutions. They also claim that the local legislation is in conflict with the Taft-Hartley Act, which guarantees to labor the right to organize and to engage in peaceful picketing.

Safety Code Extended

State seeks to afford protection to workers in heavy construction

Under an administrative order issued last week, workers on heavy construction projects in New York will come under the state's worker-safety regulations for the construction and demolition industries on July 1.

The action, taken by the Board of Standards and Appeals, was announced by Industrial Commissioner Isador Lu-

A Total of One Hundred Years of Service

Bricklayers Local 55 in Columbus, Ohio, this month paid tribute to two of its members—a father and son—who have contributed a century of service to the bricklaying craft.

At a special meeting of the Local, William A. Oare, 66, was awarded the union's coveted 50 year emblem. Present for the occasion was his father, 91-year-old John William Oare, who received his gold life-membership card in 1938. The elder Oare became a charter member of Local 55 in 1888 and has been retired nearly 20 years.

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LAID UNDER CONCRETE, Fiberglas-reinforced weatherproof papers put a tough, moisture-proof barrier between the poured slab and the ground.

WEIGHTED STRIPS of Fiberglas-reinforced weatherproof papers protect fresh mortar after workmen leave during brick and block construction.

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bin and will apply to road construction, bridge building, earth-moving operations, large-scale excavations, trenching and pipe-laying. It represents an extension of Industrial Code Rule No. 23, which the board has been applying only to the erection and demolition of buildings and other above-ground structures.

Mr. Lubin simultaneously reported the appointment of an advisory committee of 19 members, representing building, heavy construction, demolition and highway contractors, organized labor and interested government agencies, to completely revise the state's construction and demolition code.

The board's extension of Rule No. 23 followed a series of public hearings on safety. "One of the main reasons for the necessity to enlarge the area of enforcement of the regulations," Mr. Lubin said, "was to prevent repetition of a tragedy such as occurred in Brooklyn about three weeks ago." In that accident, a construction worker was crushed to death when shoring collapsed in a trench excavation for a sewer.

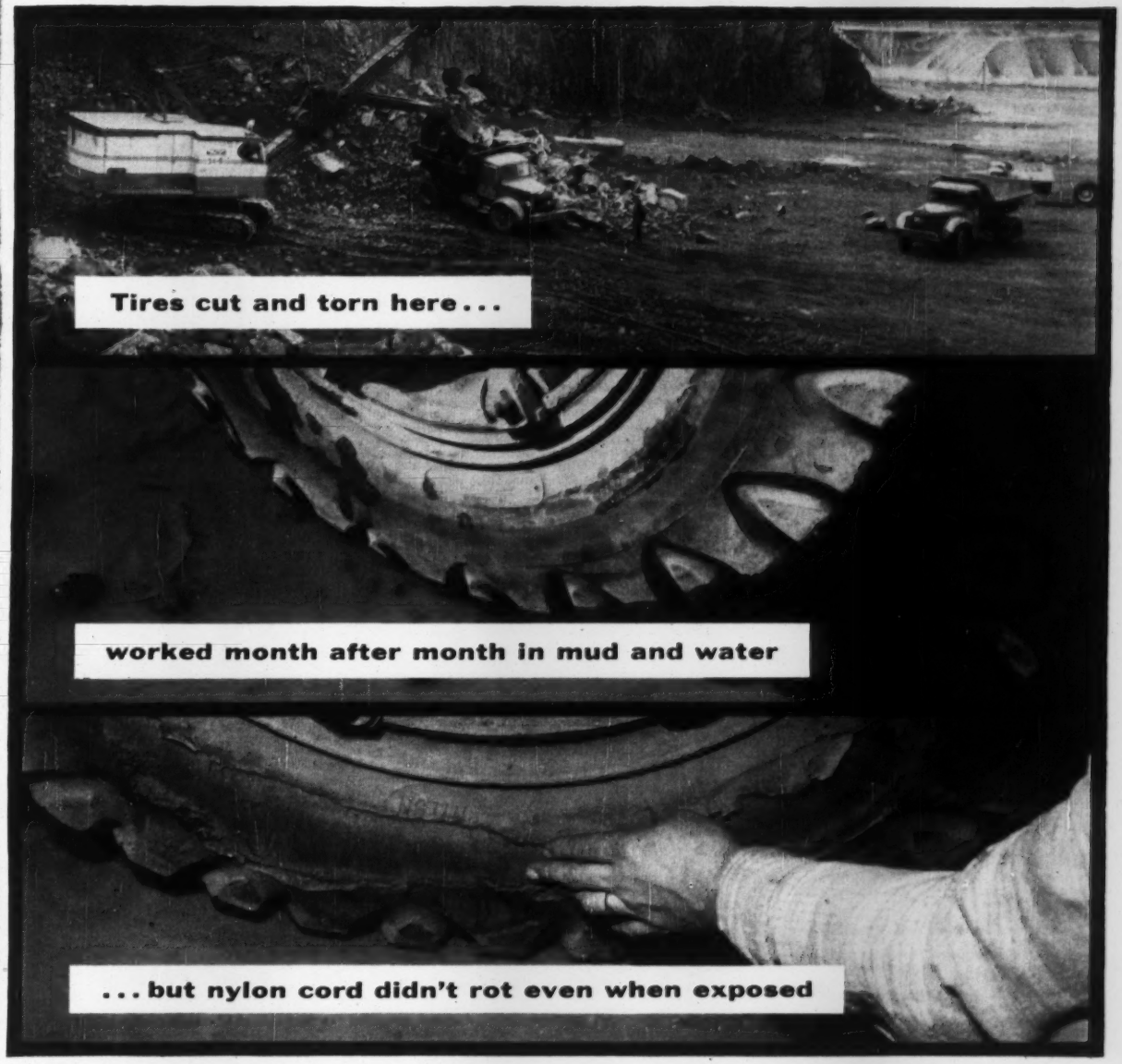
Mr. Lubin said he expects his advisory committee to come up with a "model code that will insure complete protection of construction and demolition workers," and, at the same time, meet "the necessary limits of reasonableness and practicability." The committee's proposal will be recommended by Mr. Lubin to the Board of Standards' and Appeals for hearing and adoption.

Labor Briefs . . .

• **Teamsters bolt**—The Kentucky Conference of Teamsters bolted this month from the State Federation of Labor (AFL) as a protest against the way a new constitution for the federation, preliminary to merger with the CIO, was "railroaded through." While opposing merger at the state level, the group said the withdrawal does not mean disaffiliation with the national AFL-CIO.

• **Right-to-work**—Repeal of the Louisiana right-to-work law has improved the state's industrial growth, according to State Auditor William Dodd. Addressing delegates to the Louisiana State Labor Council last week, Mr. Dodd said business in Louisiana has increased 4.6% this year while the national average is 1% off the 1956 level.

• **Manpower**—Government and industry in Nashville have joined forces to explore the possibility of setting up a new technical training school that would be the most modern and progressive in the South.



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CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, P.O. Box 12, New York 36, N. Y.

Bids: June 6, 1957.

Intercepting Sewers, Pumping Stations and Sewage Treatment Plant for the City of Norwich, Connecticut

ADVERTISEMENT

NOTICE TO CONTRACTORS

Sealed bids for the construction of intercepting sewers, pumping stations, force mains, sewage treatment plant, outfall sewer and appurtenances for the City of Norwich, Connecticut will be received at the office of the City Purchasing Agent, City Hall Building, Norwich, Connecticut, until 2:30 P.M. Eastern Daylight Saving Time on June 6, 1957, and then taken to the Council Room and publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications and Form of Performance Bond, may be examined at the office of the City Purchasing Agent, Norwich, Connecticut and at the offices of Keis & Holroyd, Consulting Engineers, 257 Broadway, Troy, New York and at the offices of Chandler & Palmer, Engineers, Thayer Building, Norwich, Connecticut and copies thereof may be obtained at the offices of Keis & Holroyd or Chandler & Palmer upon payment of $50.00 for each set. Any bidder returning such set promptly and in good condition will be refunded his payment and any non-bidder upon so returning such set within 10 days after bidding date will be refunded $40.00.

The City of Norwich, Connecticut reserves the right to waive any informalities in, or to reject any or all bids.

A certified check or bid bond made payable to the order of the City of Norwich, Connecticut, in the amount of 5% of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will, within 5 days thereafter, execute such contract and furnish a satisfactory bond. On failure to do so he shall forfeit the deposit as liquidated damages and acceptance of the bid will be contingent upon the fulfillment of this requirement by the Bidder.

The successful bidder will be required to furnish a performance bond satisfactory to the Corporation Counsel, City of Norwich, Connecticut, in the amount of the contract, and having as surety thereon such surety company or companies as are acceptable to the Corporation Counsel of the City of Norwich, Connecticut and having an office within the limits of the Town of Norwich, Connecticut.

The work will be divided into sections and subdivisions as follows:

Section I—Intercepting Sewers, Pumping Stations, Force Mains.

Section II—Sewage Treatment Plant and Outfall Sewer.

Subdivision I—General Construction

Subdivision II—Sludge Filters and Equipment

Subdivision III—Plumbing

Subdivision IV—Heating and Ventilating

Subdivision V—Electrical Work

The work may be let as one contract or separate contracts may be let for each of the sections or each of the subdivisions under any section, except that manufacturers of cast iron pipe and specials may bid directly to the City for furnishing some of these materials for each section.

No bidder may withdraw his bid within 30 days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

THE CITY OF NORWICH, CONNECTICUT
By: Edward Frechette
Purchasing Agent

Dated: April 29, 1957

Keis & Holroyd, Consulting Engrs., Troy, New York.

Chandler & Palmer, Engrs., Norwich Connecticut.

Bids: May 31, 1957.

City of Rochester, New York

NOTICE TO BIDDERS

Sealed Bids for the Construction of the Sewage Force Main and Pumping Station for Tryon Park Area—

Contract A-1—Connecting Sewers and Sewage Force Main

Contract A-2—Sewage Pumping Station—General Construction

Contract A-3—Sewage Pumping Station—Heating and Ventilating

Contract A-4—Sewage Pumping Station—Plumbing

Contract A-5—Sewage Pumping Station—Electric Wiring for the City of Rochester, New York, will be received by the Purchasing Agent at his office in Room 36, City Hall, 20 South Fitzhugh Street, Rochester, N. Y. until 11:00 o'clock A.M. Daylight Saving Time on May 31, 1957 and then at said office be publicly opened and read aloud.

Copies of the plans, specifications and other contract documents may be examined at the office of the Purchasing Agent, Room 36, City Hall, 20 South Fitzhugh Street, Rochester, N. Y., or at the offices of Havens and Emerson, Woolworth Building, 233 Broadway, New York, N. Y. and 640 Leader Building, Cleveland, Ohio, after May 2, 1957.

Plans, specifications and proposal forms can be obtained only at the office of the Purchasing Agent, of the City of Rochester, N. Y., Room No. 36, City Hall, Rochester 14, New York. A cash deposit of Thirty Dollars ($30.00) will be required for each set of plans and specifications taken from the above office. This entire deposit will be refunded if a bid is submitted on any of the above contracts or if the plans and specifications are returned completely intact and in good condition within thirty (30) days after the date of receiving bids. After that date, no plans or specifications will be redeemed and the entire cash deposit will be forfeited.

All bids will be upon and in conformity with the bidding sheets and specifications, which will be furnished by the undersigned after May 2, 1957.

Fred W. Ereth
Purchasing Agent

Bids: June 6, 1957

The City of Edmonton City Engineering Department Tenders for Construction of South Side Interceptor Sewer

Sealed tenders marked "South Side Interceptor Sewer", Contract No. 130 will be received by the City Commissioners, City Hall, Edmonton, Alberta, until noon, Thursday June 6, 1957.

The work to be undertaken includes construction of approximately 23,000 lineal feet of 60" to 108" diameter reinforced concrete sewer of which about 1500 feet will be in open cut and the balance in tunnel up to 120 feet in depth.

Plans, specifications and all information may be obtained at the City Engineer's Office, City Hall, Edmonton, Alberta, on and after Tuesday May 14th 1957, on payment of fifteen dollars ($15.00), which sum will not be refunded.

Bids must be accompanied by a certified cheque of 2½% of the total value of the tender and the consent of a bonding company. The bid cheque will be returned after a contract is signed with the successful bidder.

The lowest or any tender not necessarily accepted.

THE CITY COMMISSIONERS,
EDMONTON, ALBERTA,
CANADA.

Prequalification Date: May 20, 1957.

Board of Education—Bureau of Construction

Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y., will receive applications for prequalification of bidders from Contractors who may wish to submit bids for the proposed hereinafter specified contracts, as follows:

Furnish, deliver and install Shop Equipment—Class No. 1—Miscellaneous equipment. Class No. 2—Graphic Arts equipment, in the following schools.

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J.H.S. 139, Brook Ave, & East 141st Street.

J.H.S. 141, West 236th Street and Independence Ave.

J.H.S. 143, Sedguick Ave., & 231st Street.

Borough of Brooklyn

J.H.S. 33, Stockton & Floyd Streets.

J.H.S. 61, Empire Blvd & New York Ave.

Borough of Manhattan

J.H.S. 44, West 76th Street & Columbus Avenue.

Borough of Queens

J.H.S. 204, 28th Street & 37th Ave.

Borough of Richmond

P.S. 50, Adelaide Ave., between Clauson and Platt Streets, Oakwood.

Prequalification application forms will have to be secured and must be submitted to the Superintendent of School Buildings, Bureau of Construction Office, 4th Floor, Room 407, 42-15 Crescent Street, L.I.C. New York.

Bids When advertised will be received from prequalified bidders, only.

Time for submitting prequalification applications will expire on Monday, May 20, 1957.

William H. Correale
Superintendent of School Buildings
Dated May 2, 1957.

Bids: June 5, 1957

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. on Wednesday, June 5, 1957

For painting the Henry Hudson Bridge and incidental structures, Boroughs of the Bronx and Manhattan, City of New York, Contract No. HM-6.

Each bid must be accompanied by a deposit in the amount of $7,000.00.

Deposit for contract documents is $5.00, to be refunded upon return of the documents in good condition within 30 days after the opening of bids.

Contract documents and further information may be obtained at the office of the Authority.

Bids: May 29, 1957

The Port of New York Authority Proposal No. 1050

WATER TREATMENT SERVICE FOR PORT AUTHORITY FACILITIES

Sealed proposals for providing water treatment service at Port Authority facilities in both New York and New Jersey will be received at the office of the Director of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, N. Y., until 11:00 A.M., Wednesday, May 29, 1957, at which time and place said proposals will be opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase and Administrative Services.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, May 16, 1957

OFFICIAL PROPOSALS

Bids: May 23, 1957

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, sealed proposals will be received until ten-thirty o'clock A.M.,

Contract No.	Type	Name of Highway and Miles	Deposit For Plans	Bid Deposit	Department Estimate
Ch. 310 Laws 1957	Stabilized Gravel Surface Calcium Chloride Treatment, Access Road and Parking Areas Prestressed Concrete Superstructure Br. 195'	Little Whiteface Ski Center 0.38 Mile	$10	$15,000	$281,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: May 29, 1957

Contract O & M—430

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
TETERBORO AIRPORT
SEALCOATING, PAVING AND DRAINAGE

Sealed proposals for furnishing all labor, material and equipment for sealcoating, paving and drainage repairs at Teterboro Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, until 11:00 A.M., Wednesday, May 29, 1957, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, May 16, 1957

Read the Official

Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

OFFICIAL PROPOSALS

advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 23rd day of May 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following project in Essex County. G. L. NICKERSON, DISTRICT ENGINEER, 353 BROADWAY, ALBANY, NEW YORK.

Bids: June 4, 1957

Test Borings
Contract 449

SEALED BIDS will be received by the Board of Water Supply at its offices, thirteenth floor, 120 Wall Street, New York City until 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M. Eastern Standard Time) on Tuesday, June 4, 1957 for Contract 449, for drilling two vertical test borings in Upper New York Bay to determine the elevations, nature and conditions of the bed rock, and the depths and character of the overlying materials. Borings will be made from the surface of the water through the materials overlying the rock and into bed rock. Each boring shall penetrate 200 feet or more into sound bed rock as ordered but not more than 500 feet.

Pamphlets of the contract containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1312 at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition.

IRVING V. A. HUIE, President; EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4905) will be received at Building No. 234, Camp White, 9 miles north of Medford, Oregon, until June 18, 1957, for furnishing labor and materials for Green Springs powerplant, switchyard and penstock, Rouge River Basin Project, Oregon. Location 11 miles southeast of Ashland, Oregon. Principal items are 48,000 cu. yds. excavation; 194,700 pounds reinforcement; 2,400 cu. yds. concrete; installing 50-ton stiffleg derrick; furnishing and installing penstock and surge tank; installing and testing one 23,500 horsepower hydraulic turbine; and other work. Completion time 660 days. For particulars, address Bureau of Reclamation, P. O. Box 937, Boise, Idaho; P. O. Box 386, Camp White, Oregon; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: June 26, 1957

Board of Chosen Freeholders of Bergen County, New Jersey

Public Notice is hereby given that sealed proposals for furnishing labor and materials for the construction of the New Court House Wing, Alterations and Additions to Administrative Building, at Hackensack, Bergen County, New Jersey, will be received by the Board of Chosen Freeholders of the County of Bergen, New Jersey, at Room 405 of the Administrative Building, Hackensack, N. J., on the 26th day of June, 1957, at 2:00 P.M., Daylight Saving Time.

Separate bids will be received for:

CONTRACT NO. 1—GENERAL CONSTRUCTION WORK
CONTRACT NO. 2.—STRUCTURAL STEEL & MISCELLANEOUS IRON
CONTRACT NO. 3—ELEVATORS
CONTRACT NO. 4—PLUMBING WORK
CONTRACT NO. 5—HEATING, VENTILATING & AIR CONDITIONING WORK
CONTRACT NO. 6 — ELECTRICAL WORK

Copies of the Drawings and Specifications may be seen at the Office of York & Sawyer, Architects, 101 Park Avenue, New York 17, N. Y., and at the Clerk of the Board of Chosen Freeholders, Room 405, Administrative Building, Hackensack, N. J.

Drawings and Specifications for all of the above contracts will be given out to bidders by the Office of the Clerk of the Board of Chosen Freeholders, Room 405, Administrative Building, Hackensack, N. J., during business hours from noon May 20, 1957, to noon, June 24, 1957, Daylight Saving Time, after which date no further Drawings and Specifications will be obtainable.

Copies of Specifications and Contract Drawings will be furnished to each bidder upon the deposit of a certified check, drawn to the order of Office of York & Sawyer, in the amount of One Hundred ($100.00) Dollars. This deposit will be refunded upon the return of said Specifications and Drawings.

The Board of Chosen Freeholders hereby reserves the right to reject any or all bids, or to accept the one for each Contract that, in its judgment, will be for the best interests of the County of Bergen. All proposals must strictly comply with the "Instructions to Bidders" contained in the Specifications.

BERGEN COUNTY BOARD OF CHOSEN FREEHOLDERS
FRED W. MEUTER
CHAIRMAN, BUILDING COMMITTEE
Attest:
WILLIAM R. SMITH,
CLERK

Bids: June 4, 1957

Ocean City-Longport Bridge Deck Reconstruction of South Approach Beam Spans

CAPE MAY COUNTY BRIDGE COMMISSION
CAPE MAY COURT HOUSE, NEW JERSEY
Dated: May 7, 1957

Sealed bids for the deck reconstruction of the south approach beam spans of the Ocean City-Longport Bridge will be received by the Cape May County Bridge Commission in its offices at Cape May Court House, New Jersey, until 2 P.M. Eastern Daylight Saving Time, June 4, 1957 and then at said place, publicly opened and read aloud.

The work consists generally of replacing the existing concrete deck on the thirteen 35-foot rolled beam simple spans which form part of the south approach of the Ocean City-Longport Bridge as shown on the Plans.

The Information for Bidders, Proposal, Contract, Contract Bond, Plan and Specifications may be examined at the office of the Commission, First National Bank Building, Cape May Court House, New Jersey, and at the office of Howard, Needles, Tammen & Bergendoff, Consulting Engineers, 99 Church Street, New York 7, New York.

Contract documents will be furnished for $5.00 for each set, upon application to the Commission or to the Consulting Engineers. The payment will not be refunded and contract documents are not required to be returned.

The Contract will be awarded or the proposals rejected within thirty (30) days from the date of opening proposals. The Commission reserves the right to waive any informalities in and to reject any or all bids.

Cape May County Bridge Commission
Charles B. Middleton, Chairman

OFFICIAL PROPOSALS

Bids: June 5, 1957

Darby Creek Sewer Construction

Notice is hereby given that sealed bids or proposals for furnishing all labor and materials for the construction of sanitary sewers along Darby Creek, Little Darby Creek and the West Wayne area, including manholes and miscellaneous appurtenances in the Townships of Radnor and Haverford, Delaware County, Pennsylvania will be received by RADNOR TOWNSHIP MUNICIPAL AUTHORITY at its office, 212 East Lancaster Avenue, Wayne, Radnor Township, Delaware County, Pennsylvania, up to four o'clock P.M. Eastern Daylight Saving Time, the 5th day of June A.D. 1957, at which time the proposals will be publicly opened and read aloud.

The sewer construction work will be divided into four (4) contracts designated as CONTRACT #1, CONTRACT #2, CONTRACT #3 and CONTRACT #4. Bidders may bid on individual contracts or on a combination of contracts 1, 2, 3, & 4.

The bid and other data submitted by bidders will form the basis for the negotiation of a unit price contract for the work.

General Conditions, Special Conditions, Proposal Forms and other contract documents and separate Plans and Specifications for the work may be obtained on or after the 6th day of May A.D. 1957, at the office of the Radnor Township Municipal Authority, 212 East Lancaster Avenue, Wayne, Pennsylvania, upon deposit of a check payable to the Authority in the amount of $40.00 for one set of Contract Plans and Specifications for the above contracts. If the Plans and Specifications are returned to the Authority in good condition within 10 days after the opening of bids, the deposit will be refunded to each contractor submitting a proposal. If the documents are not returned to the Authority within the time stated or if no bid is submitted, the deposit will be forfeited.

Bids shall be submitted in the form attached to the Specifications. A certified check for five percent (5%) of the bid must accompany each bid as a guarantee that the bidder will enter into a contract in writing and will furnish bonds in the event that his bid is accepted. Should the successful bidder fail or refuse to execute a contract and furnish the required bond or bonds within the time specied in the General Conditions, the sum of five percent (5%) of the successful bid shall be considered on account of damages or as liquidated damages to the Authority for such failure or refusal, and the Authority may retain the certified check for said damages. The certified check is to be made payable to Radnor Township Municipal Authority. No bid may be withdrawn for a period of 60 days after the date set for the opening thereof.

The successful bidders will be obliged to furnish Surety Bonds for the full amount of the contract prices conditioned for their faithful performance and additional bonds in the amount of the contract prices providing for the payment of labor and materials entering into the work. The bonds are to be in a form attached to the Specifications with sureties to be approved by the Authority.

All proposals must be delivered to the Secretary of the said Authority at the Authority's office, 212 East Lancaster Avenue, Wayne, Delaware County, Pennsylvania, on or before 5th day of June A.D. 1957, 4:00 o'clock, Eastern Daylight Saving Time, marked "Proposal for Sanitary Sewers, Contract # ____", at which time and place the bids will be opened and publicly read.

Radnor Township Municipal Authority reserves the right to waive any informality in, or to reject, any of all bids or items of bids thereof.

By order of the
RADNOR TOWNSHIP
MUNICIPAL AUTHORITY
William Beeson
Chairman
E. O. Heuser
Secretary

U. S. Government

BRIDGE CONSTRUCTION—U. S. Army Engineer District, Memphis, Corps of Engineers, P. O. Box 97, Memphis 1, Tenn. Sealed bids will be received at this office until 1:30 P.M. C.S.T., 11 June 1957, and then publicly opened, for constructing four county bridges across St. Francis River in St. Francis and Lee Counties, Arkansas. $25.00 deposit required on plans. Information on request.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4907) will be received at Winters, California, until June 13, 1957, for furnishing labor and materials for additions to Tracy Administration Building, Central Valley Project, California. Location near Tracy, California. Principal items are lump sum for constructing addition to Tracy Administration Building; and other work. Completion time 150 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento, California; P. O. Box 546, Winters, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4909) will be received at Albuquerque, New Mexico, until May 28, 1957, for furnishing labor and materials for earthwork, clearing, and structures for irrigation, rehabilitation, Belen Unit 2, Middle Rio Grande Project, New Mexico. Location near Isleta, New Mexico. Principal items are clearing and cleaning along approximately 6.15 miles of waterways; 1,180 cu. yds. excavation for new structures; 163 cu. yds. concrete; and other work. Completion time 225 days. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4910) will be received at Camp White, Oregon, until June 19, 1957, for furnishing labor and materials for fish screen structure for Savage Rapids Dam, Grants Pass Project, Oregon. Location near Grants Pass, Oregon. Principal items are 1,450 cu. yds. excavation; 580 cu. yds. concrete; furnishing and installing 24-inch diameter steel discharge pipe; and other work. Completion time 640 days. For particulars, address Bureau of Reclamation, P. O. Box 386, Camp White, Oregon; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: May 29, 1957

Contract O & M—440

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
Miscellaneous Pavement Resurfacing

Sealed proposals for furnishing all labor, material and equipment for performance of miscellaneous pavement resurfacing at Newark Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, until 11:00 A.M., Wednesday, May 29, 1957, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, May 16, 1957

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4911) will be received at Denver, Colorado, until June 4, 1957, for furnishing one 15- by 29.65-foot penstock coaster gate with extra replacement parts for Grand Coulee Dam, Columbia Basin Project, Washington. Delivery is desired within 360 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

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P-5064, Engineering News-Record
Class. Adv Div., P. O. Box 12, N. Y. 36, N. Y.

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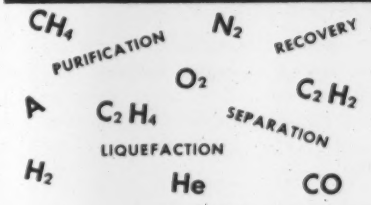

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P-1635, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

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P-4928, Engineering News-Record, Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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Civil Engineer for Public Works Department of New Jersey municipality for surveys and construction, field and office. State education, experience and salary requirements. P-5038, Engineering News-Record.

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Const. Supers, Prod. men for top Bergen IND bldr. Send resume, following, sal. P-5045, Engineering News-Record.

Const. Estimator & Asst. Exec. for top Bergen IND bldr. Write following, sal. P-5046, Engineering News-Record.

Wanted: Field Maintenance Superintendent for large inventory, Modern Heavy Construction Equipment Company. Field administration experience and Technical training desired, with capacity to assume complete responsibility for maximum operating efficiency at minimum cost. Forward resume, including photo, age, education, previous employment, marital status, objectives and salary to: Davis S. Craven, Equipment Superintendent, Replogle Equipment Company, P. O. Box 308, Circleville, Ohio.

Engineers—Architects—Draftsmen. Experienced in design and supervision of construction on water works, sewers and general building construction. State experience, age, salary requirements and earliest date available. P-4813, Engineering News-Record.

Construction Supers Year-round Work, Tops only, Bergen-Co. Indust. G.C., State Labor Following, Sal. P-5100, Engineering News-Record.

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We want two additional experienced men to sell heavy construction to industrial and institutional accounts. We require top flight men and expect to pay them accordingly. Please include detailed resume of experience and education with first reply to Personnel Director.

BALTIMORE CONTRACTORS, INC.
711 S. Central Avenue Baltimore, Maryland

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Construction—P. E., for Bergen Co. Pkg. Bldr., State Following, Indust. Land, &/or Estimating Exp., Sal. P-5102, Engineering News-Record.

Wanted—Paving and dirt superintendent for stabilized base course and concrete paving at Naval Air Station. Location, Eastern Shore of Virginia. Salary open. Reply Irons & Reynolds, Inc., 1724-H St., N.W., Washington, D. C.

Engineering Graduates with experience in the testing and control of concrete, asphalt and soils for work abroad. Give full details of experience and education. Salary range $8000.00 to $10,000.00 per year. P-5104, Engineering News-Record.

Seaway contractor requires Draftsman-Designers, Computers, Field Engineers on form checkouts, Party Chiefs and Instrument Men. Work week to consist of six (6) days. Send resumes with desired salaries. Application not considered unless desired salary is indicated. All inquires to be kept confidential. P-5083, Engineering News-Record.

Structural Engineer—Small, well established engineering office in Northern Ohio needs an engineer. Must have steel fabricating background as we do considerable steel detailing as well as design. Duties will be to supervise design and detailing, handle liaison work with clients, be responsible for production of good work and meet completion schedules. Some board work as checker may be required initially. Salary and profit sharing with eventual participation in ownership. Our employees know of this ad. All replies confidential and will be acknowledged. P-5094, Engineering News-Record.

Structural Draftsmen—We have openings for several structural detailers and checkers for building and bridge work. Will consider juniors who have some training or experience. Steady employment with good rates and working conditions. Usual employee benefits. John B. Hollyfield & Co., 635 East 185th Street, Cleveland 19, Ohio.

Wanted—Aggressive manager for growing 25 man structural fabricating shop, midwest location. Write stating qualifications and compensation desired. P-5093, Engineering News-Record.

College Instructor—Young Engineering Graduate. Some industrial experience desirable. Opportunity to work on advanced degree. Write: Head, Department of Engineering Drawing, Iowa State College, Ames, Iowa.

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Architects' Superintendent—ten years experience—desires work in middle Atlantic States. PW-4962, Engineering News-Record.

Estimator, Project Manager, Purchasing, Highway Construction. 40 years experience, 60 years of age, good health, Long Island preferred. PW-4913, Engineering News-Record.

General Construction. Manager or Superintendent. Experience in hospital, schools, monumental, industrial buildings, canals. 34 years experience. Speak English, French, Spanish. Best references. Would like to work South America, Spain or South U.S.A. Available after 2 weeks. PW-4904, Engineering News-Record.

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P-4934—Engineering News-Record
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Structural Engineer, B.S.C.E.; 26; single; two years design experience in bridges and buildings, concrete and steel. Some construction and business background. Several languages. Desires design or construction job, preferably abroad. PW-5088, Engineering News-Record.

Chief Estimator, B.C.E., 10 yrs. heavy construction experience, excavation, utilities, paving, structures. Prepare bids, payments, subs, costs, admin. P.E. license N.Y. & N.J. Prefer N.Y., N.J. or Conn. PW-5095, Engineering News-Record.

C.E., 26, Associate, learn with small, local contractor. Field, office. Anywhere. PW-5084, Engineering News-Record.

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3—ALLIS CHALMERS HD-15AC Hydraulic Dozer, Torque Conventor, S/N 2990, 2870, 2868, Location: (2) New Jersey (1) Ohio

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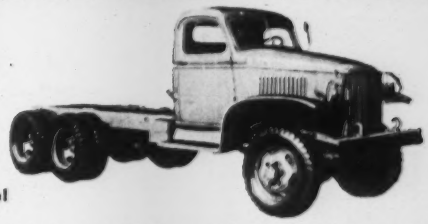

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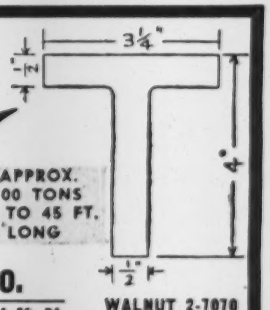

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Water Policies Need Push

PRINCIPLES FOR A NATIONAL WATER POLICY have once again been stated by qualified engineers concerned with water supply, water use, conservation and control. And while complete accord could not be expected on every thought expressed, a number of sound principles are set forth.

Both Engineers Joint Council and the American Water Works Association, in these new statements, return to the subject of how best to utilize water resources to meet the needs of the nation (ENR May 2, p. 25). And since there is a considerable similarity of interest among individuals on the two groups, both statements reflect the same basic line of thinking.

Actually, the only notable difference is that the power people represented on EJC's Review Board made their influence felt more strongly than did those identified with power on AWWA's committee. In this connection, it is remarkable, indeed, to note that the concise statement of the waterworks group, perhaps 1,200 words, does not once use the word "power." In fact, it doesn't even refer by implication to hydroelectric power except perhaps in its general mention of industrial use of water. EJC's more lengthy statement, on the other hand, cites the "increasingly important role" of electric power in the development of water resources, and devotes an entire section to the subject.

It may be argued that the EJC policy statement departs, at points, from expression of principles based solely on the logic of sound engineering; here and there it takes an excursion into theories of economics and government as, for example, when it goes afield from water policy to condemn the giving of preference in purchase of federally generated power to public bodies. For its part, the AWWA statement may be criticized as too narrow and simplified a view of a broad and complicated problem.

In general, only extremists among detractors will find anything radically wrong with either statement. EJC makes a special point of greater participation of state, local and private agencies in water resource development, with the federal role confined to those areas where the national interest is definitely involved. It also urges the frequently proposed plan for a federal board of review. AWWA echoes this latter proposal. In addition it recommends a priority-of-use principle, with domestic use first, and others—industry, agriculture, navigation, etc.—placed in accordance with the contribution each can make to the economic and social welfare.

There is, in fact, so much good in both declarations that they and their writers are to be commended highly. And so, it is fervently hoped that each statement will be accorded deserved recognition and application at the various levels of policy-making in government. Indeed, all the fine proposals suggested will have little significance unless steps are taken to convert them from just so much wishful thinking into laws on the statute books. That is the problem to be faced—particularly by Engineers Joint Council, which could be the most forceful voice of the engineer—if all the effort that has gone into these and earlier studies is not to be lost. The practical questions that EJC should answer now cover such subjects as the type of legislation that is needed to implement these findings, who is to sponsor it, and finally where support for such legislation is to be found.

Suez—A Brilliant Performance

THE ENGINEERING FRATERNITY has a right to be proud of the job that Lt. Gen. Raymond A. Wheeler did in clearing the Suez Canal of sunken obstructions. Carried on under the spotlight of world attention, the Suez job placed its engineering administrator in the center of a world-wide stage where his every action was subject to instant recording, his every statement fodder for the news ticker. And even though the opportunities for error may have been no more numerous than on other construction operations of comparable magnitude, the consequences of such errors were immeasurably increased because of their possible political implications.

To a greater extent than is probably realized, the reputation of U. S. engineers as construction directors with organizing ability and know-how rode on General Wheeler's actions. And of even more importance, these actions were a powerful factor in our international diplomacy.

Faced with these responsibilities, General Wheeler turned in a brilliant performance. Displaying engineering knowledge of the nature and scope of the salvage job, he assembled an international task force of men and machines probably without peer in the world. Employing diplomacy, he solved the ticklish problem of utilizing French and British equipment, in the face of Egyptian protests. Exercising patience and administrative ability, he worked in and around political obstacles which many times were more formidable than the physical ones.

Statements in the press credit the Suez job with being the greatest accomplishment in General Wheeler's distinguished career. It is doubtful if this five month stint for the United Nations in Egypt is of the order of either his job as wartime commander of U. S. Engineers in the China-India-Burma theater or as Chief of Engineers later, but it is without question a crowning achievement.

In any event, on his return to the U. S. last week, this 72-year-old engineer could have the satisfaction, if his modesty permitted him to think of it, of knowing that he had enhanced the world standing of American engineering while at the same time he had been our nation's most effective ambassador in the Middle East.

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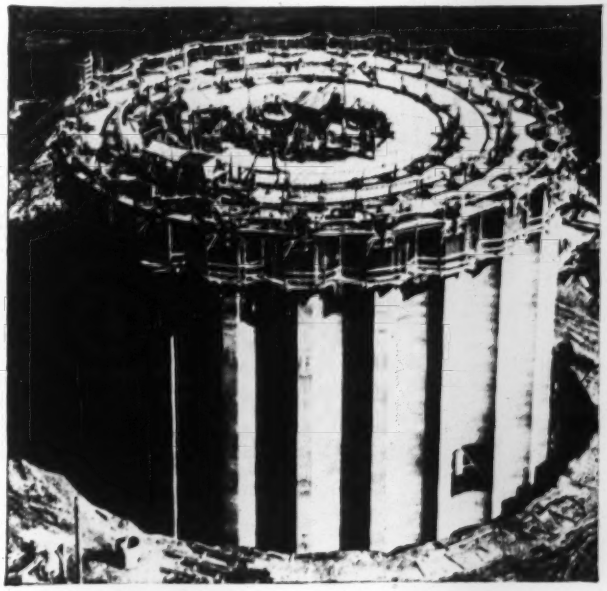

Left: View of the four tower cylinders under construction, with slip-form platform at top.

Right: Wire-winding machine wraps finished tank in pre-stressing operation.

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